..THE IRON AGE..

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ACCURATE KNOWLEDGE OF COSTS VITAL IN EFFECTING ECONOMIES

By
THOMAS B. FRANK
Treasurer, Cincinnati Planer Co.,
Cincinnati

TO derive full advantage from the period of prosperity that is believed to lie ahead, management of industrial plants, says the author, must consider the installation of modern accounting methods, including budget control, standard cost systems, together with proper distribution of the overhead burden. Recent developments in accounting practice that have helped many companies during the period of depression to increase profits or decrease losses are stressed as indicative of what should be more widely done before the next era of business progression, when costs and selling prices undoubtedly must be figured on a lower basis than in the past decade.

BUSINESS has recently had to solve many problems and has done a splendid job in many cases. Errors that may have been committed have too often, perhaps, been the result of inadequate or incorrect information concerning costs. The mere possession of a cost system does not necessarily mean that the figures reputed to represent costs are accurate. A few examples will support this statement.

There is the business that has been operating for a number of years with a cost system predicated upon a distribution of burden or overhead to the product based on the dollar amount of wages paid to the factory workers. I feel certain that most of such systems have fallen by the wayside long ago, but there are a few executives, and accountants also, who still cling to the idea that burden distribution has some sort of a fantastic relationship to wages paid. In other words, the work done by a man earning 70c. per hr. carried more burden than another man's work at 55c. per hr. for similar work.

Many others still believe that all overhead items can be thrown together in a lump sum for the entire shop without regard for the varying operations performed, the different classes of equipment employed and the floor space used. Anyone can see that work done on a large boring mill certainly must actually cost more than work done on the bench. Many guesses have been made as to the relative differences and those guesses used as costs. Incorrect cost figures can be the only result.

Modern accountancy has devised methods for coping with the increasing complexities of modern business, by the introduction of the machine-hour or burden center method of burden distribution. All expenses having a direct bearing upon the operation of each item of equipment or groups of similar machines are charged directly to that machine or group, or burden center, as it is often called. Evidently that method is productive of results that more closely approximate accuracy for cost purposes, and are not misleading like the older methods.

A further step has been taken in making for in-

creased accuracy by the adoption of the "normal production" or "normal capacity" basis. The actual normal expected capacity of a machine or department is ascertained from past experiences and the best knowledge of the organization, and the expense is based on that normal expectancy. It is then reduced to the basis of actual operation. The deviation in operation from that expectancy is then the item that should be watched and analyzed to effect its elimination or the correction of the factors causing the deviation from the predetermined expectancy. These variations give a measure of shop and equipment efficiency that is very valuable to the management.

One of the latest improvements in cost accounting science has been the devising of the so-called "standard cost" systems. Predetermined standards are set for performance and are translated into the dollars and cents outlay necessary for procuring labor, materials and the incidental expense or overhead. These standards then become the "cost" and the deviations from standards are accounted for as a measure of the efficiency of the various departments and divisions of the business. I will not attempt to explain the accounting procedure for this method, but rather will dwell upon the needs of and the value of using such methods.

A "standard cost" is more than a standard of performance. It is a definitely established cost, based not on what a given operation *actually* costs, but upon what it *should* cost under definitely established conditions.

Management today usually knows just what its plant consists of, knows the performance of every machine and tool. It also knows what may be expected of the men when they are operating the equipment. It knows the qualities of the materials used in its products and it has a fair knowledge of the expense incidental to the performance of the men and the machines. The combined knowledge of these factors can readily be translated by the cost accountant into computations that will serve as definite standards of cost or "standard costs."

Standard costs, once established, should not be changed unless the methods of operation are changed. They should be constantly compared with the actual costs as the various operations are completed. Herein lies the benefit to be derived from the use of standards. Suppose that a standard cost has been established for milling a certain machine part as follows:

Labor	$ 5.00
Materials	7.00
Burden	10.00
Total	$22.00

Computation of the actual costs reveals the following:

Labor	$ 7.00
Materials	8.00
Burden	14.00
Total	$29.00

It is apparent that something occurred which did not measure up to the predetermined standard of what the particular milling operation should cost. This deviation from the standard was investigated. It was found that the employee was a new man and inexperienced on the particular job; the equipment was badly in need of repairs and could not be operated at its regular speed, and improper tools were used. The materials used cost $1 more than standard because a few of the parts were spoiled by the inexperienced man. The burden increased in proportion to the hours consumed by the man, but in addition it was found that the machine leaked oil and this necessitated the use of additional supplies over and above the standard amount required to operate the machine. It goes without further comment that considerable action followed the analysis of the variation from standard cost on that particular job.

When standard costs are met, however, in general, no further analysis is required. Only the variations from standard are looked into. This results in less work for the cost department with a decrease in the operating cost thereof. After all, management is interested only in the deviations from predetermined standards. With standard costs these deviations are shown up immediately and are promptly analyzed, no time being wasted on the costs that compare favorably with the standard.

During the past several months it has become increasingly difficult for many businesses to earn a profit in many cases despite increased volume and steady production. Of course the concerns that have felt the sting of the depression have had the same problems to contend with, theirs showing up as increased losses. It is regrettable that many have curtailed their accounting activities at a time when such activities should be the most productive in enabling management to meet the difficulties of decreasing profits through the media of effective control of costs. It certainly must be a short-sighted manager who limits the activities of the cost department when the thing most needed is no doubt scientific cost reduction and control. I do not want to give the impression that cost work is the one and only cure for present business ills. Such is not the case. I merely wish to take the stand in defense of the work that the cost department and the cost accountant perform for the best interests of the business. This work, intelligently used, will go a long way toward reducing to a minimum the effects of the depression on the profit accounts.

Business Would Be Healthier if Budgeting Were More Widely Used

There is little question in the minds of most business executives about the desirability of the use of the budget in business. It has proved successful in the regulation of national and municipal affairs, and has proved its worth in many well-managed business

enterprises. Standard costs are more or less predicated upon the use of a budget. A budget, after all, is nothing more than a definitely established schedule of facts indicating just what the business expects to do during a specified period of time, expressed in units and the dollar value of those units.

First, the potential sales possibilities are determined through market research and by devious other methods. When that is set, then all other activities of the business are scheduled in such manner as to meet the sales budget. Production is scheduled to conform with the sales budget and all expenses are scheduled to conform with the planned production. When potential sales possibilities are determined to be, say, $100,000 for a given period, how foolish it would be to schedule production to turn out $200,000 in the same period. Scientific budgeting starts with the possible sales and is worked down through the production and administrative routines and even to the expected profit and loss.

Under present conditions management needs more than ever the benefit of information contained in a good budget. The concern using a budget and the resulting methods of control is best equipped to withstand the pressure of a depression. The business that has made the fullest use of its accounting departments and equipped itself with modern tools of management can more effectively operate for the best interests of stockholders, employees and the community. I venture to say that business generally would be in a more healthy state if budgeting procedure had been more universally adopted.

After the sales budget is set and production schedules determined, the next step is the determination of the costs of the production. With the use of "standard costs" the job may be quickly accomplished with a fair degree of accuracy. If total production cost for the given sales at these predetermined standards are found to be out of line with the income to be derived from the sales, action may be started at once to make changes in production methods, expense disbursements and the like, to assure the operation of the business at a profit. It is evident that such a procedure is vitally necessary at the present time.

If all factors entering into the production and ultimate distribution are found to be consistent when figured at standard cost, then it is proper to go ahead with the program as set forth in the predetermined schedules. It is important, of course, that these schedules be maintained. In this manner alone is it possible to keep total cost at a consistent level. It is next to impossible to control costs after they have been incurred and money disbursed to meet them. After all, costs of every description should be used for current control rather than for mere historical record.

When a budget has been set up the control of all activities becomes a matter of common sense administration, for the budget indicates just what should be accomplished, and the actual performances as they are completed indicate just what has been done. A comparison with the budget will indicate whether every activity of the business is in step or not, and pressure can be brought to bear where pressure is needed to keep every department in line. All guesswork is thereby eliminated and the old "hit-or-miss" methods are no longer tolerated.

Today's Values Must Be Used for Property Accounting

Property accounting plays a very important part in present-day efficient management. Considerable amounts are invested in plant buildings and equipment and an accurate accounting for their use in the business is of the utmost importance. Much has been said and written concerning the proper depreciation of plant facilities and I will only urge that management look to its property accounting to ascertain that modern methods are used by accountants. Today's values must be used as the basis for depreciation charges to cost, in order that costs may reflect present-day conditions. It is today's markets that every business endeavors to serve. Without today's costs it cannot hope to know accurate results of today's business activities. Cost figures based on values of past years are merely historical and therefore not of much value in determing present policies.

Interest on the investment in plant facilities and inventories is another item that must not be overlooked. Many accountants contend that interest is no part of cost, but the fact is that any business must earn sufficient to justify the investment in its physical being. To accomplish this without confusion and without the danger of basing policies on incomplete information, the safest method is to include an amount computed at the current market rate for interest on all facilities regularly employed in the business. This assures a return through selling prices of an amount sufficient to justify the continuance of the business. If selling prices cannot be obtained that will cover the cost, including interest, then the management definitely knows that steps must be taken to adjust prices or reduce costs of other items. Steps must be taken in any event to protect the earning power of the capital investment, lest that investment become frozen.

An effective method of setting this out for the attention of management is to indicate the total amount of return on the investment that should be earned by the business, and compare that figure with the actual earnings. This results in a figure that represents the over or under attained margin of earning. This information should be placed directly upon the regular periodic statement of profit and loss so that the course of earnings on the investment may be traced from month to month.

The inclusion of interest is very necessary when machine-hour or production center burden rates are to be determined. It is impossible to set standard rates without a standard unit of value for all items of equipment.

(*Concluded on page* 1221)

SMALL, CONTINUOUS CONVEYOR OV

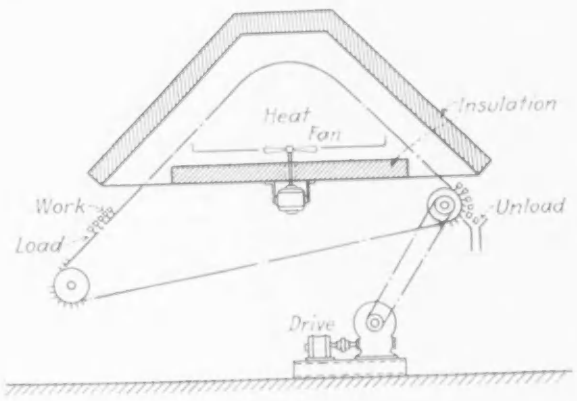
CONTINUOUS processes, particularly with regard to baking ovens, are usually thought of as adjuncts of big plants. This article shows, however, by practical examples, how the equipment can be used by plants which are far from the enormous units in which continuous conveyor systems found their early development. Evidently the advantage is just as great in the small and moderate-size plant as in the large one, when it comes to installation of proper labor-saving equipment.

BECAUSE so many of the largest industrial ovens have been constructed for continuous operation, there has been a tendency to assume that only the larger ovens are suitable for continuous operation. As a matter of fact, however, continuous operation is in no sense limited by oven size. Many continuous ovens are being used which can easily be accommodated in a floor space of 100 sq. ft.

Nor is there any limitation on the type of continuous oven, where only a small unit is required. There are small "A"-type ovens, vertical ovens, inclined ovens and other types operating as efficiently as larger units of the same class. Likewise the choice of operating temperatures is just as wide for the small unit as for the larger. In fact, the determining factor in choosing between continuous and intermittent operation is purely one of the functions of the oven.

A continuous unit has certain well-defined economic advantages over the intermittent oven. Important among these are:

Increased capacity
Saving in gross production time
Better fuel economy
Less floor congestion
Greater facility in handling production
Less danger of product breaking or marring
Automatic loading and unloading
Maximum accuracy in control of temperature and baking cycle
Minimum operating labor
Maximum flexibility of baking cycle
Wider range of applications
Straight-line flow of product in process
Greater flexibility in output volume
Automatic reproduction of any given baking cycle



Longitudinal section through small A-type oven used for baking metal commutators. Note parts being unloaded automatically as the conveyor leaves the oven.

As examples of the practical application of continuous operation to the small-sized oven, three installations are here described. One is an "A"-type oven, one is a vertical oven and one an inclined oven. Each is successful in its own field and demonstrates the practicability of the small-sized unit. All were designed and built by Young Brothers Co., Detroit.

"A"-Type Oven for Commutators

A MANUFACTURER of vacuum cleaners is using in Detroit an "A"-type continuous conveyor oven to bake his small-motor commutators, the oven itself being hardly larger than an oven manufacturer's exhibition model. It measures 7 ft. 3 in. long, 6 ft. 6 in. high and only 24 in. wide.

Commutators processed in this oven are used in the vacuum cleaner motor. They are only 1⅛ in. in diameter and ½ in. in length. A composition mica separator is used between the commutator segments. After assembly, it is necessary to bake the commutator to establish the necessary bond between seg-

YOR OVENS PAY IN THE SMALLER PLANT

ment and separator. A temperature of 500 deg. F. is used to accomplish this.

Lower temperatures leave the bond incomplete, while higher temperatures are an economic waste. It is also important that the temperature throughout the baking chamber be uniform, so that all units of the oven load be given the requisite heat treatment. One reason for installing the present oven was to avoid objectionable temperature variation.

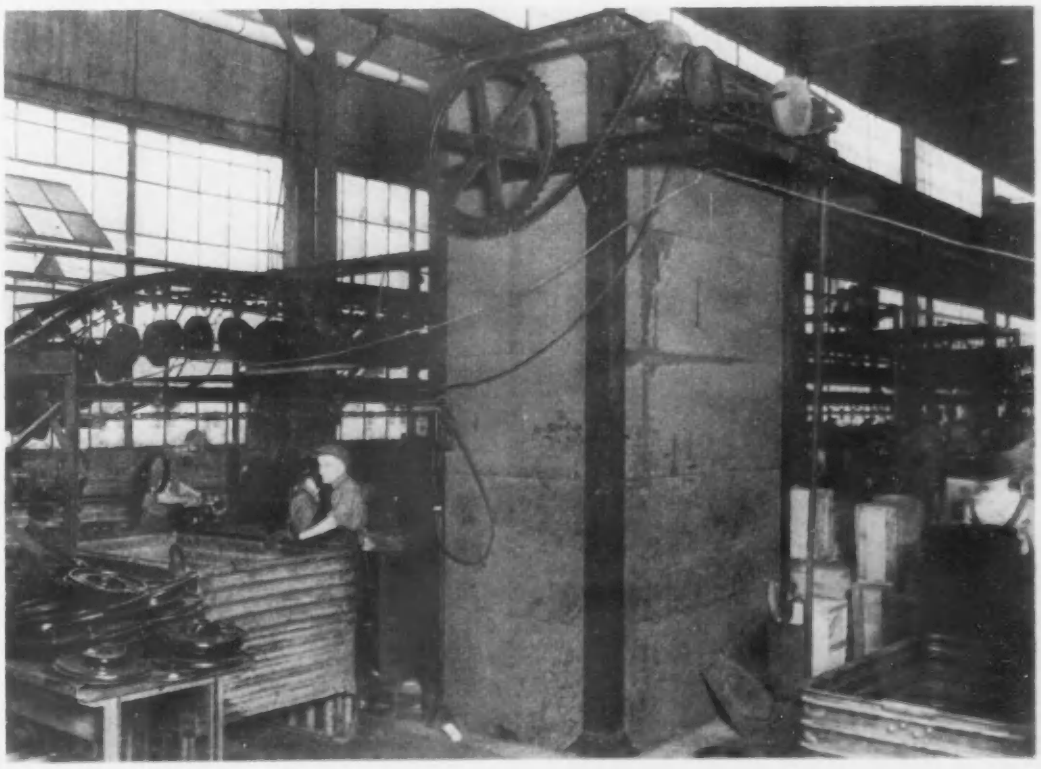
The commutators are carried through the oven on a small conveyor made up of cross rods (160 of them) spacing two strands of 1½-in. pitch roller chain. Each cross rod carries nine ¼ in. pins spaced on 1½-in. centers. Each pin carries one commutator. After passing through the baking chamber the conveyor turns downward and travels beneath the oven floor back to the entrance end. As the conveyor pins turn downward at the change of conveyor direction just after leaving the oven exit, the baked commutators automatically fall off their pins and into a tote box on the floor directly beneath. The baked commutators are thus automatically unloaded.

This conveyor is driven from a 220-volt, 3-phase, 60-cycle ¾-hp. motor and through a speed reducer. The capacity of this unit at normal speeds is 3300 commutators a day. The heating units for this oven consist of twelve 750-watt General Electric resistors on a 220-volt alternating circuit and controlled through a Bristol temperature controller and automatic control panel.

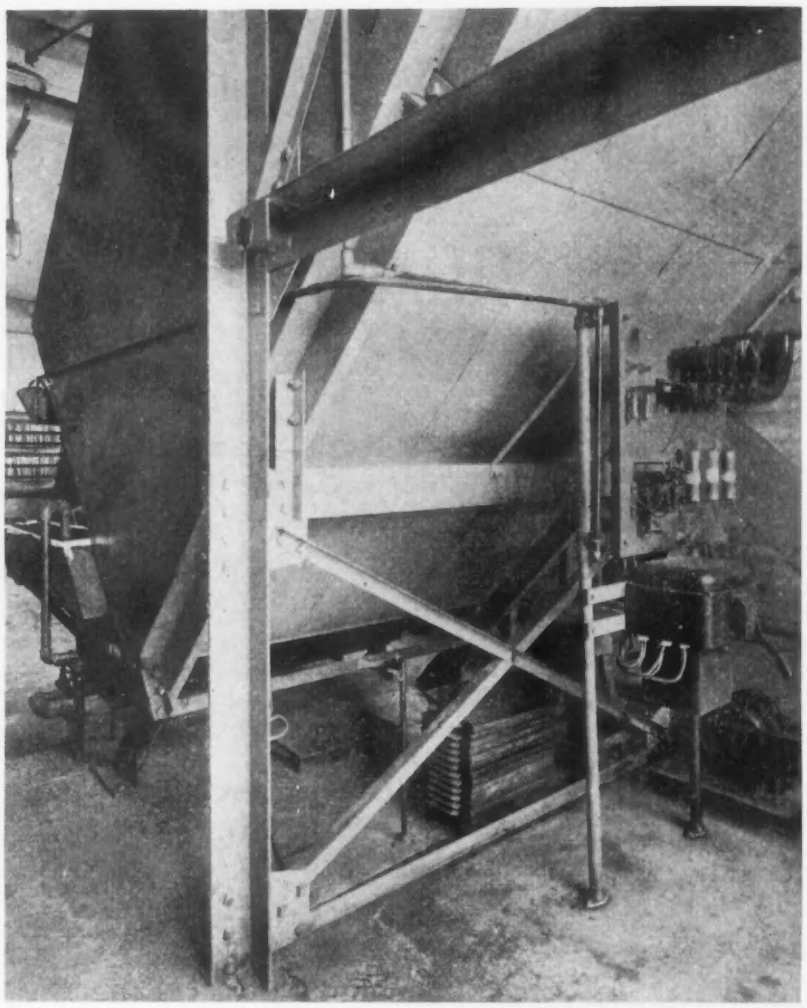
The machine operator who handles the final assembly operation on the commutator also loads the oven, the oven conveyor being within easy reach of his machine position. Consequently the operating labor chargeable against oven baking is practically negligible.

Vertical Oven for Brake Lining

ANOTHER interesting application of the small oven is that of baking molded brake lining segments to make them pliable enough to fit properly



VERTICAL oven used to bake brake lining in plant of Midland Steel Products Co., Detroit.



UNDERSIDE of inclined oven at Wolverine plant of Parker Rust-Proof Co. showing arrangement of control panel.

(Below) Method of loading parts to be baked into the inclined oven in the Wolverine Enameling Division of the Parker Rust-Proof Co.

the brake bands with which they are fabricated. This operation is carried on at the plant of the Detroit Pressed Steel division of Midland Steel Products Co.

When cold this brake lining material is too stiff to handle properly. On the other hand if it is overheated, or if it is allowed to remain too long even at the proper oven temperature, it again becomes hard and has a tendency to become brittle. Consequently, it is highly desirable to have both temperature and baking period under close control in processing this material. After considerable experimenting, it was found that the best results were obtained when baked at 400 deg. F. for 10 min.

Originally a cabinet-type oven was used for this purpose. With an increase in production requirements, it

was decided to replace the old oven and at the same time take advantage of the automatic control of both baking cycle and temperature, as well as other features afforded by continuous baking. A vertical oven was chosen for the work. It is a single-compartment unit 6 ft. 2 in. wide by 3 ft. 6 in. deep and 12 ft. 9 in. high inside. This vertical installation requires a minimum of floor space, which is decidedly at a premium in this plant.

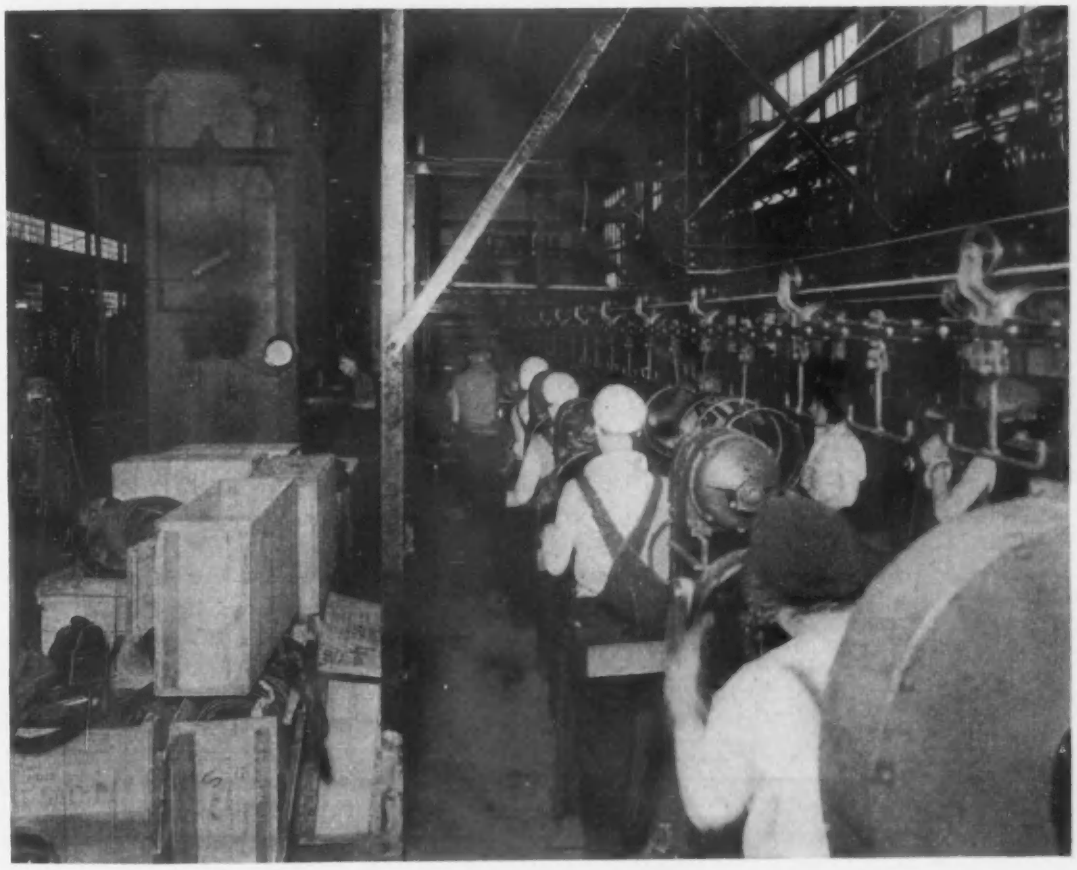
As the oven serves two assembly lines, it is necessary that four pieces of brake lining be delivered at a time, two to each assembly line. This is arranged by having each oven conveyor shelf accommodate four pieces.

A single opening in the oven structure serves both as entrance and exit for the pieces being processed. One man handles both loading and unloading. After the four hot pieces of product are removed from any given conveyor shelf, four new pieces are placed on it, to be carried through the baking chamber.

The Palmer-Bee conveyor which runs through the baking chamber of this oven is equipped with 22 carriers 6 in. wide and 5 ft. long, suspended from spacer pipes 12 in. on centers between two matched strands of No. 131 chain. The conveyor travels normally 20 in. a minute and is driven by a 1-hp., 220-volt, 1200-r.p.m. motor. The motor operates through a worm-gear speed reducer and a Reeves variable-speed transmission.

Heating is direct and self-contained. The heating elements are full-length pipe burners using 530 B.t.u. manufactured gas. The oven carries an 8-in. Brown recording thermometer and the temperature is controlled by a Partlow automatic temperature controller. It burns about 155 cu. ft. of gas an hour and has a capacity of 12,000 pieces of brake lining a day.

An interesting point in connection with this installation is the fact that revisions in the equipment layout of this plant have necessitated moving this unit five different times since it originally went into operation. Because of its comparatively small size and sturdy construction, its moving was a matter of small concern to the management. Each move was made quickly and economically.



ASSEMBLY line being supplied with brake lining which has been heated in the vertical oven shown at left.

Inclined Oven for Small-Parts Japanning

ONE of the newer types of continuous unit—the inclined oven—is gaining popularity rapidly because of its easy operation and flexibility. The Wolverine enameling division of Parker Rust-Proof Co., Detroit, is using such a unit for japanning a wide range of small equipment parts, such as fan units for electrical refrigerators, switch-box covers, valve hand-wheels, brackets, clamps, etc. This small oven was installed to relieve the congestion in the larger units and to reduce operation cost.

A room approximately 24 x 58 ft. houses the department handling this work at the Wolverine plant. The raw product comes in in bin trucks. It is given a naphtha wash at the loading table and then hung on suitable carriers for oven processing. Two girls

(*Concluded on page* 1221)

ELECTRONIC CONTROL C

By RAYMOND FRANCIS YATES
Member, Institute of Radio Engineers

THOSE who would make use of the photo-electric tube should bear in mind that both the tube itself and the circuit used to amplify its output should be selected to fit the operating conditions. The designer should first determine whether the amplifying circuit should have dynamic or static characteristics; that is whether or not it should respond to a series of rapid impulses. If it is to meet this condition, a dynamic circuit must be employed. If the cell is to respond to only an occasional impulse or to impulses below sound frequency, a static circuit will be needed. The difference between a static and dynamic circuit will be noted from Figs. 1 and 2.

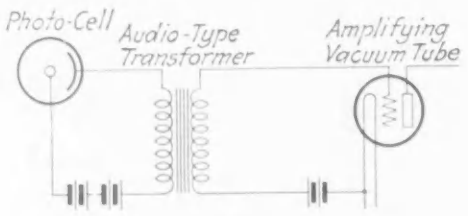


Fig. 1.—Dynamic amplifying circuit for photo-tubes that must respond to a series of rapid impulses.

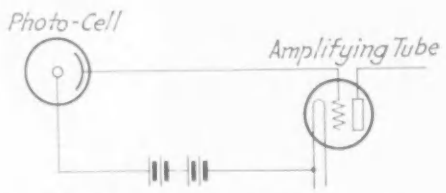


Fig. 2.—The simpler static circuit amplifies the output of photo-tubes sensitive to impulses below sound frequency.

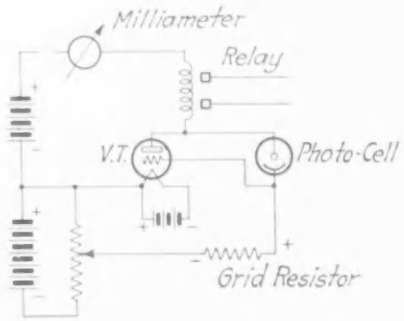


Fig. 3.—A potentiometer in the grid circuit permits adjustment of the overall sensitivity of photo-tube and amplifiers.

Aside from the above, the cell itself should be choosen to meet the conditions under which it is to operate. If its use does not involve the selection of articles according to shade or color, a cell with a practically flat color curve should be purchased. In certain very special cases, cells operating on either ultra-violet or infra-red light may be used. The point to be brought out is that the cell should have characteristics that will accommodate the special conditions under which it is to operate. In every case, the problem to be solved should always be carefully outlined to the manufacturer of the photo-tube so that the proper tube for the purpose may be obtained.

Amplifying Circuit Should Be Flexible

Having first determined whether the circuit should be dynamic or static, the nature of the work further determines the nature of the amplifying circuit to be used. Because of several variable factors present and because of the desirability of adjusting the overall sensitivity of the photo-electric tube and the associated vacuum tube or tubes (depending upon the degree of amplification desired) for specific applications, it is generally found advisable to provide a circuit adjusting device. This is commonly a potentiometer in the grid circuit of the vacuum tube. Such an arrangement provides a certain amount of flexibility and permits variable factors to be compensated. A more or less common amplifying circuit is shown in Fig. 3.

In carefully designed amplifying circuits, the output current in the plate circuit of the amplifying tube may be made directly proportional to the intensity of the light striking the active element of the tube. A circuit may also be arranged in such a way as to have the output current *decrease* as the light striking the cell increases. This is usually termed an inverse circuit while the other arrangement is called a forward circuit.

Thyratrons Provide Great Amplification

The degree of amplification necessary is a very important factor. This depends upon the amount of work to be done. For automatic counting and similar light work, perhaps only a single vacuum tube need be used in the amplifier. Such is the case with the ringing of alarms and the flashing of signals; but where more extensive mechanical motion must be initiated as a result of photo-electric action, it is usually necessary to resort to thyratron amplification, the size of the thyratron tube depending upon the amount of work to be done. Although the thyratron can handle directly

ROL OF MACHINERY

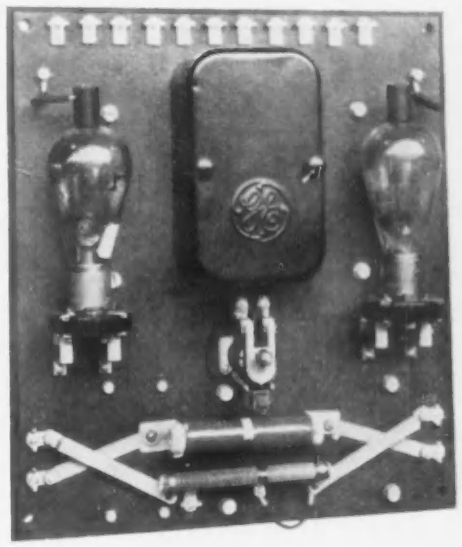


PHOTO-ELECTRIC tubes are designed for various specific operating conditions. Included are the automatic starting and stopping of machinery, checking the size of wire, counting under conditions not admitting of the use of mechanical counters, etc. One type of tube is actuated by varying intensities of light; others are sensitive to color, even to ultra-violet or infra-red light. Amplifying circuits must be designed with the operating conditions in view. In this respect thyratrons, by controlling a comparatively large current without mechanical relays, have contributed to the effectiveness of many of the photo-electric tube applications described in this article, which supplements one on the fundamentals, appearing in the issue of Oct. 22, page 1052, and which is to be followed by another on applications.

enough current to operate small motors, the power it is sometimes called upon to control often makes it necessary to have the thyratron merely operate an automatic switch that in turn will control a heavier circuit. With such a system, there is practically no limit to the amount of current that may be controlled by photo-electric action.

We shall now consider the various methods of operation. In general photo-electric tubes may be used to determine size, shape, color, density, condition of surfaces (degree of polish for instance), counting and interruption (such as the tearing of paper in a mill). Other special applications have been made and many more will be made. An interesting example is the control of glass bottle machinery, in which flaws in the glass are detected by the photo-tube.

Photo-Electric Tube Checks Size of Wire

One method of making comparison of size is indicated in Fig. 4. The system is shown as applied to wire although it may be employed to check the size of many other products. The circuit is so designed that the output of the vacuum tube amplifier will be directly proportional to the degree of the light striking the cell. The electrical measuring instrument used in the plate or output circuit of the amplifier is usually a milliammeter recalibrated to read in metrical fractions or inches as may be desired.

Fig. 5 shows a system used for counting, inspecting

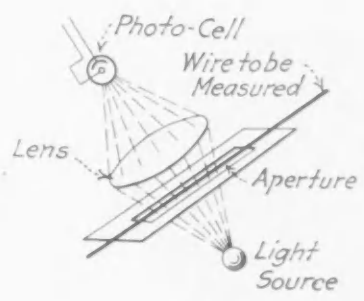


FIG. 4.

FIG. 4.—How wire may be checked for size by photo-electric means.

Fig. 5.—Counting small parts or inspecting condition of surfaces.

Fig. 6.—Counting, or measuring translucence.

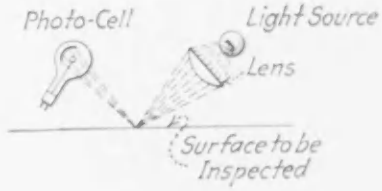


FIG. 5.

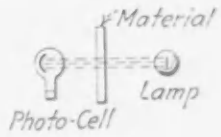


FIG. 6.

or determining the condition of surfaces. It will be noted that both of the systems mentioned make use of a simple optical arrangement for the concentration of the light source.

A method for counting articles or measuring the light transmission property of various materials is illustrated in Fig. 6. It is an excellent means for classifying materials by the variation in the transmission coefficient. An optical system may be included if desired. Still another method of inspection which is being applied in plating solutions and other fluids, is shown in Fig. 7. This is usually referred to as the refractive method. Another arrangement of photo-electric apparatus for inspecting liquids is shown in Fig. 8. An interesting and useful application is indicated in Fig. 9. Here pressure is controlled between limits of tolerance by the use of a double system, using two light sources and two photo-electric cells.

A most practical method of measuring for use on flying shears, is illustrated in Fig. 10. Here a high degree of speed is encountered and an accurate check of measurement could not be obtained in any other way.

Photo-Electric Control of Machine Tools

The application of photo-electric cells to lathe control is of special interest. Recently a number of large pipe-facing machines have been equipped with such apparatus and have been found very satisfactory. The photo-electric equipment is arranged to stop the transverse motion and to advance the cutting tool when the pipe reaches the proper position. In a number of instances, photo-electric relays have replaced mechanical limit switches on the tables of large rolling mills.

Photo-electric counting equipment has found general application not only in manufacturing establishments but elsewhere as well. They are being used to count pedestrians, automobiles, steel bars and billets on rolling mills, refrigerator parts, lamp sockets, packaged goods, and even the drops of oil in automatic oiling machinery. Such a counting system possesses several distinct advantages. It is far more accurate than human count. It can be made many times faster than ordinary mechanical counting and offers the distinct advantage of counting very heavy articles which would soon destroy an ordinary mechanical counter. On the other hand, it will count very light articles that would not exert enough mechanical force to operate a counter of the ordinary style. Then, too, it is often difficult to place a mechanical counter in such a position on automatic machinery that it will operate properly. In using the photo-electric counter, the light may be placed at a considerable distance from the tube and it is even possible to bend the light beam so that awkward positions may be reached. The bending may be done simply by using clear quartz rods which may be said to conduct light in much the same way as water is conducted through a pipe.

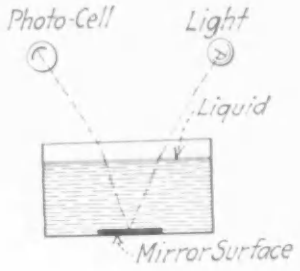


FIG. 7.

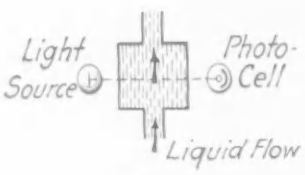


FIG. 8.

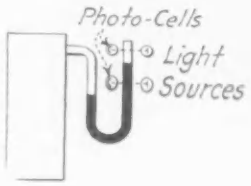


FIG. 9.

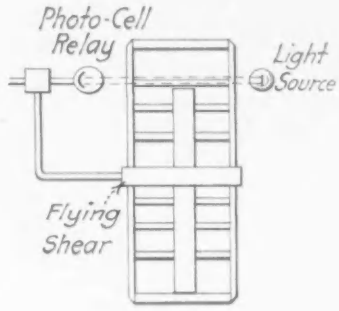


FIG. 10.

Figs. 7-8.—Inspecting liquids for clearness.

Fig. 9.—Controls actuated by simple gage.

Fig. 10.—Automatic operation of flying shears.

Simple mechanical inspection is made possible at a very high rate of speed. Manufacturers of collapsible tubes for toothpaste and the like have recently applied photo-tube inspection with a high degree of success. Previous to this, these containers would sometimes reach the consumer in a leaky condition. Now the tubes can be whirled between a light source and a photo-electric tube and those with holes in them are automatically dropped into a scrap box.

In the manufacture of small cotton bags, photo-electric relays are being used to initiate operations when the sacks reach the proper position. Many other interesting applications could be mentioned but those outlined are sufficient to give an indication of the versatility of the vacuum tube when used in connection with the photo-electric tube. In the concluding article of this series the application of other electronic devices will be described.

MANY METALS USED IN NAVY DIRIGIBLE AKRON

◆ ◆ ◆

WHILE aluminum and its alloys predominated as metal in the construction of the airship Akron, built by the Goodyear Zeppelin Corpn. for the United States Navy, several ferrous alloys and other metals were required in building the ship. The two outstanding requisites in the selection of metals were strength, wherever it was required, and lightness. There is a great deal of mechanical equipment in the airship in addition to that used in its actual propulsion.

Alloy steels in nickel, chrome-molybdenum and other grades are used throughout the ship, according to the strength or other specific qualities required because of the use or location of the part. Nickel steel is used for outrigger fittings for strength. Exhaust manifolds are of stainless steel. Non-magnetic alloy steel is used around the control boards where other metals would magnetize.

Various fittings and parts are of plain carbon steel and some iron is used, mostly as rivets, although all the 6,500,000 rivets in the ship framework proper are of duralumin. Some parts and fittings are of magnesium and others are of monel metal. Fuel lines near the engines are of bronze. Some of these lines are of copper. The bars are brass. Some of the delicate navigation instruments are of platinum.

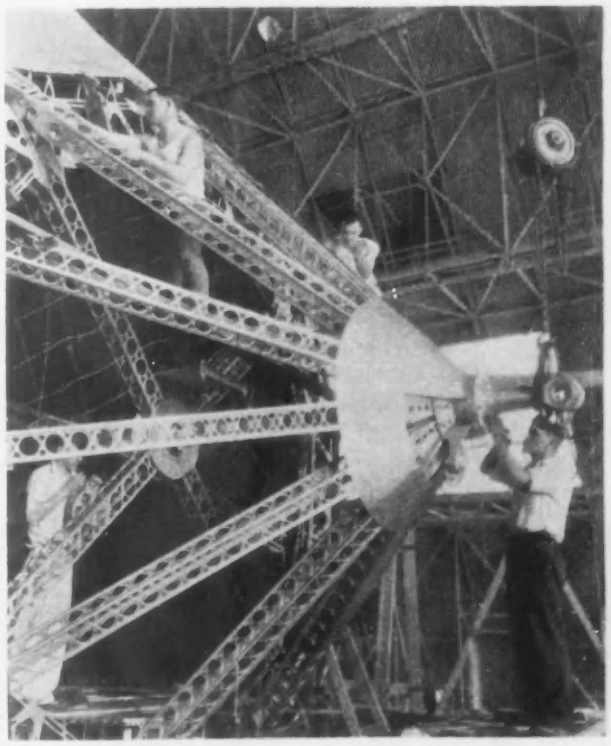
The framework and many fittings and parts are of duralumin. Gas and oil storage tanks and heating and ventilating pipes are of aluminum and to a large extent the fuel and oil lines are of the same material. Aluminum is used wherever possible in the telephone system and this, with switches, 18 instruments and three miles of cable, weighs only about 250 lb. To facilitate lacing, duralumin eyelets were placed along the edges of the panels of fabric that form the outer covering, there being an average of over 800 eyelets to a panel.

Safety Rules in Cooking

Food is prepared in the galley on an aluminum stove weighing only 110 lb. and heated by propane gas. Flame is protected by the finest aluminum gauze, which allows sufficient air to keep the flame alive but prevents its escape from the stove. The light-weight coffee urn is electrically heated. Other kitchen utensils, furniture, bathroom fixtures and various accessories such as waste paper baskets are aluminum. Cold-storage equipment will be added later.

Engine room equipment includes, in addition to the usual engine instruments, a special-type blower that supplies fresh air for intake purposes, crankcase ventilation and ventilation of the engine room itself. In the generator room there are two 8-kw. 110-volt d.c. motors, each driven by an independent gas engine. These supply current for the lights, radio, water and oil heaters, small motors, ventilating fans and other

(*Continued on page* 1221)

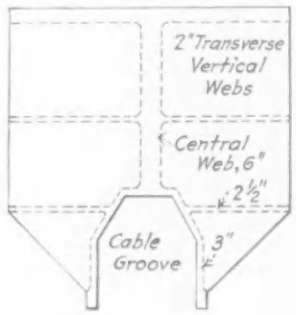


This shows the "openwork" ribs and struts of which the ship's skeleton is made. Workmen are attaching nose fittings.

MAKING THE STEEL SADDLES FOR T

By SIDNEY G. KOON
Associate Editor, THE IRON AGE

EIGHT cast steel saddles, a total of 32 huge steel castings, carry the four 36-in. cables over the two 640-ft. towers of the new Hudson River bridge at New York. Each saddle weighs about 180 (net) tons, the largest of its four



GENERAL idea of cross-section of saddle casting, showing considerable variation in metal thickness.

castings being some 113,000 lb. and the smallest, 69,000 lb.

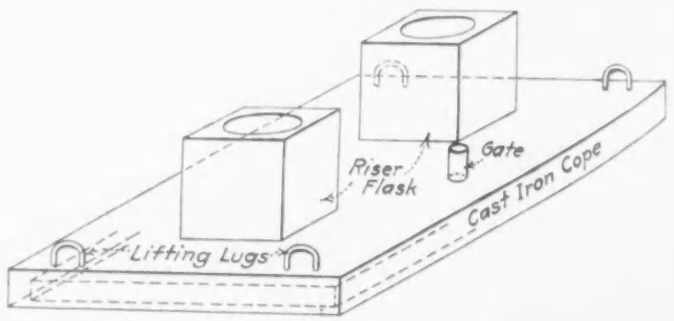
These castings were made and machined by the Midvale Co., Nicetown, Philadelphia. Acting under instructions of the Port of New York Authority, they were shipped in such manner that each car—carrying one casting—could be run at once upon the float which was to take it to the base of its tower. Here the casting was picked up, by the 200-ton crane atop the tower, and quickly put in place. The last shipment (trainload) arrived so closely to schedule that the cars were shunted, one by one, upon the barge—the first one at the instant of arrival, without one minute's delay.

In the eyes of officials of a plant accustomed to work of this magnitude, this was simply "another job," a bit "fussy," perhaps, but all in the day's work. But those of us to whom anything of this great size is always impressive find much of interest in the methods by which such "another job" is prosecuted.

Generally speaking, there were two main problems to be solved. One was the successful casting of these great masses of steel in such manner as to avoid flaws at any point. The other was the machining of the castings to exceptionally close tolerances for such massive work. These two accomplishments are briefly described, successively, in what follows.

Preparations for Making the Castings

UNUSUAL care was taken in preparing a foundation, such that there should be no possible settlement at time of casting. Five locations were available for the work, four in the steel foundry proper and the fifth in an adjoining building reachable by the open-hearth pouring crane. This latter location

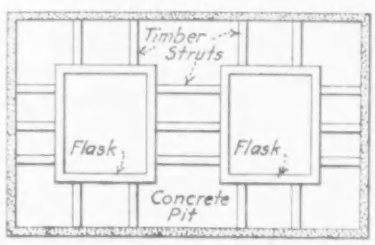


Schematic representation of cast iron cope, made for covering top of castings and resulting in considerable reduction in molding time.

has a concrete pit large enough for one of the smaller flasks.

In the steel foundry two flasks, for the largest castings, were placed in a single large concrete pit, 25 by 40 ft. by 23 ft. deep. Space for a flask for the smaller castings was found at the end of a core pit nearby. The fourth location here was made by digging a deep hole in the floor, large enough for a flask, and lining its hard-packed sides with heavy timbers to take the side thrust, of which more later.

Illustrative of the way the locations were prepared is that of the large concrete pit. About a foot of molding sand was put in the bottom and rammed as hard as it could be done. This was followed by several inches of loose sand, which then was scraped level with a long straight-edge. On this a heavy steel bottom plate, 2½ in. thick, was placed and the flask, in cast steel sections, bolted on in layers, as shown in one illustration. Two lowest layers had been bolted on before the bottom plate was lowered into the pit.



METHOD of arranging flasks in large concrete pit, and supporting them by struts against distortion.

THE HUDSON BRIDGE CABLES

MASSIVE steel castings involve exceptional precautions in caring for shrinkage and other strains. Particularly is this true when adjoining sections differ greatly in thickness. Such problems had to be met in making the saddle castings to support the cables on George Washington Bridge over the Hudson River at New York. The 32 castings average about 45 net tons each, machined, and were subjected to unusually rigid inspection. They had to be made to exceptionally close tolerances and some of the operations upon them involved the use of engineering expedients not often encountered.

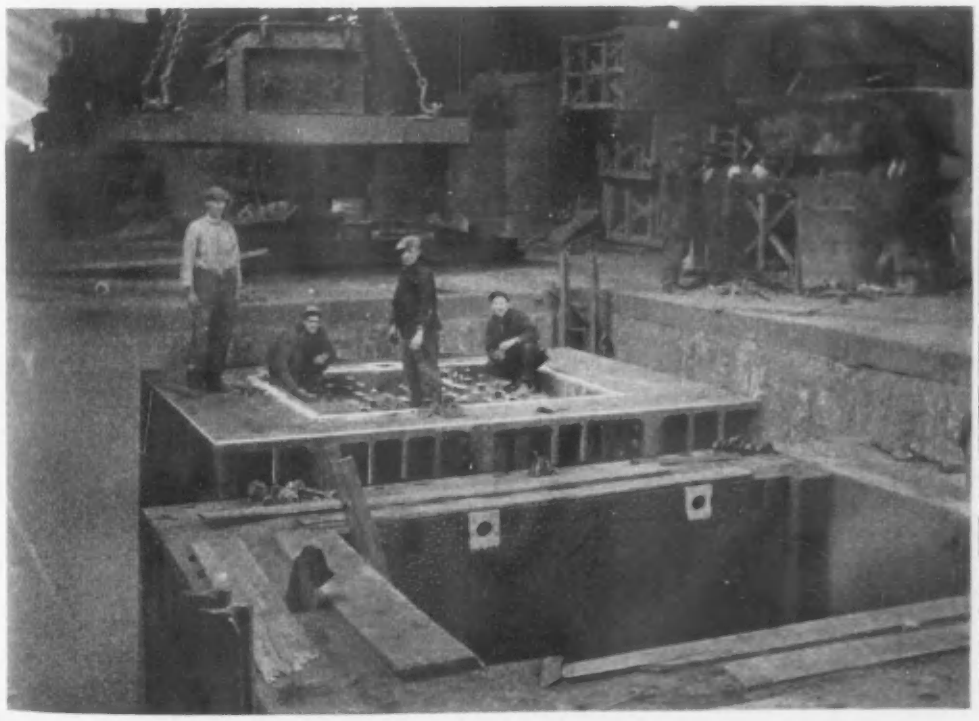
These flask sections are of a standard pattern, 30 to 72 in. long, and 24 in. high. They are 2½ in. thick, heavily ribbed, and are joined by 1¾-in. vertical bolts and 2-in. horizontal bolts.

Having built up a flask in this manner, a load of 400,000 lb. was placed upon it to make sure that it was beded properly and that there would be no future movement. And it may be mentioned here that the height, from bottom of casting to top of the risers, was 17 ft. About 18 in. of sand was then rammed, hard, in the bottom of the flask as a bed for the pattern. Coke and ashes for vents were used here, as judgment dictated. Then the pattern was set, upside down with regard to the future use of the casting, and sand was rammed as hard around it as the air rammers could set it. About 2 in. of facing sand was used, the rest being heap sand suitably tempered. This use of heap sand from previous castings saved a large amount of handling.

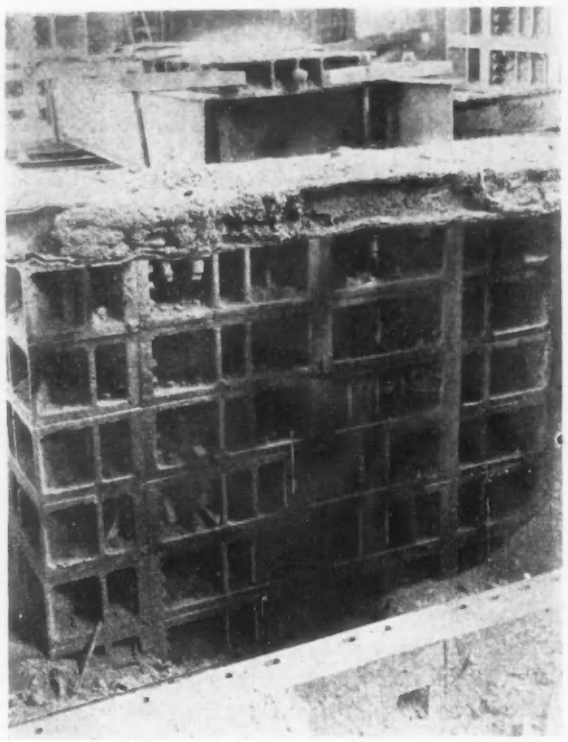
For the cope a box-form of cast iron was made, as shown in one sketch. This measured, for the larger castings, about 10 x 12 ft. and was 12 in. deep with 3-in. flanges and 3-in. flat surface. Its weight was about 25,000 lb. Two holes were left for risers, well reinforced by peripheral flanges. Sand was rammed hard in this—in what was to be the under side—and held in place by a liberal use of prickers. This device is said to have saved a large amount of molding work. On top were placed two steel flasks to contain the risers, 18 x 30 in. for the smaller castings and 24 x 36 in. for the largest, in each case being 36 in. high.

Before the cores were set and the cope was put in place the mold was thoroughly dried by fires of coke and coal, in baskets lowered into place. The sides then received a silica wash.

Pouring was through a 4-in. runner-brick gate leading to four openings into the mold, two at top and two near the bottom. One illus-



Two molds in concrete pit. In foreground the mold shows two upper openings from the gate. There are also two openings near the base. The further mold shows men setting chaplets on top of cores.



FLASKS arranged for making one of these castings. At top the cope is surmounted by flasks to hold the risers, and is tied to the main flask by steel rods.

tration, in which men are cleaning one of the castings, shows the gates and runners still attached. Another view, in which chaplets are being set above the cores in one mold, shows the two upper gates in the far side of the other mold, nearest the camera.

Each casting was made from one ladle of metal from one open-hearth furnace. Nominally of 50 tons capacity, these furnaces frequently are charged to a total of 70 or 75 tons. For these castings the weight of metal was about 165,000 lb. in the largest molds, and 100,000 lb. in the smallest. Pouring was from a full-open nozzle until the metal was about halfway up the risers. Then a sprinkling of graphite was thrown over each riser and a slow feeding of metal—a little to one riser and then to the other—was kept up until the risers were full.

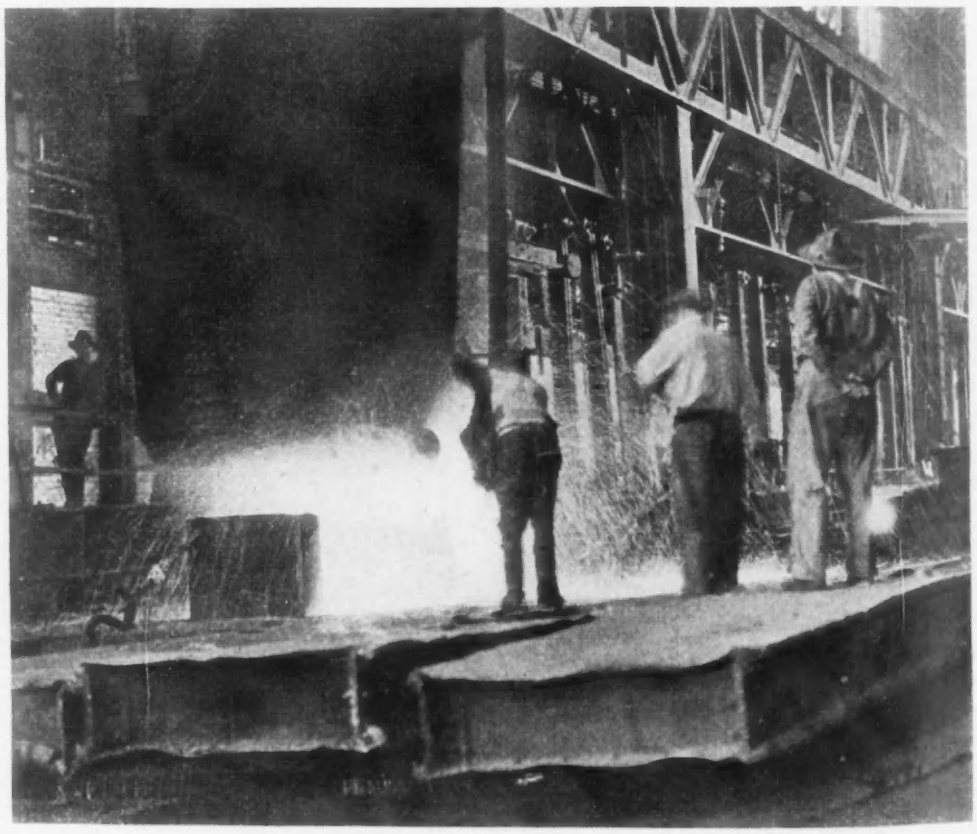
Because of the design of these castings some misgivings were felt at first as to the matter of shrinkage strains. As shown in a schematic sketch, the central rib, directly under the cable groove, where the greatest thrust of the cable would come in service, is about 6 in. thick. But the envelope making contact with the cable is only 3 in., the horizontal ribs running lengthwise of the cable 2½ in. and the vertical cross ribs 2 in. thick.

To keep the cope from "floating," the riser boxes were bolted down to the flask. These holding-down bolts can be seen in the picture of the flask. They obviated any necessity for placing weights on the cope, for they transferred all "buoyancy" to the entire weight of flask, sand and casting and effectually prevented movement.

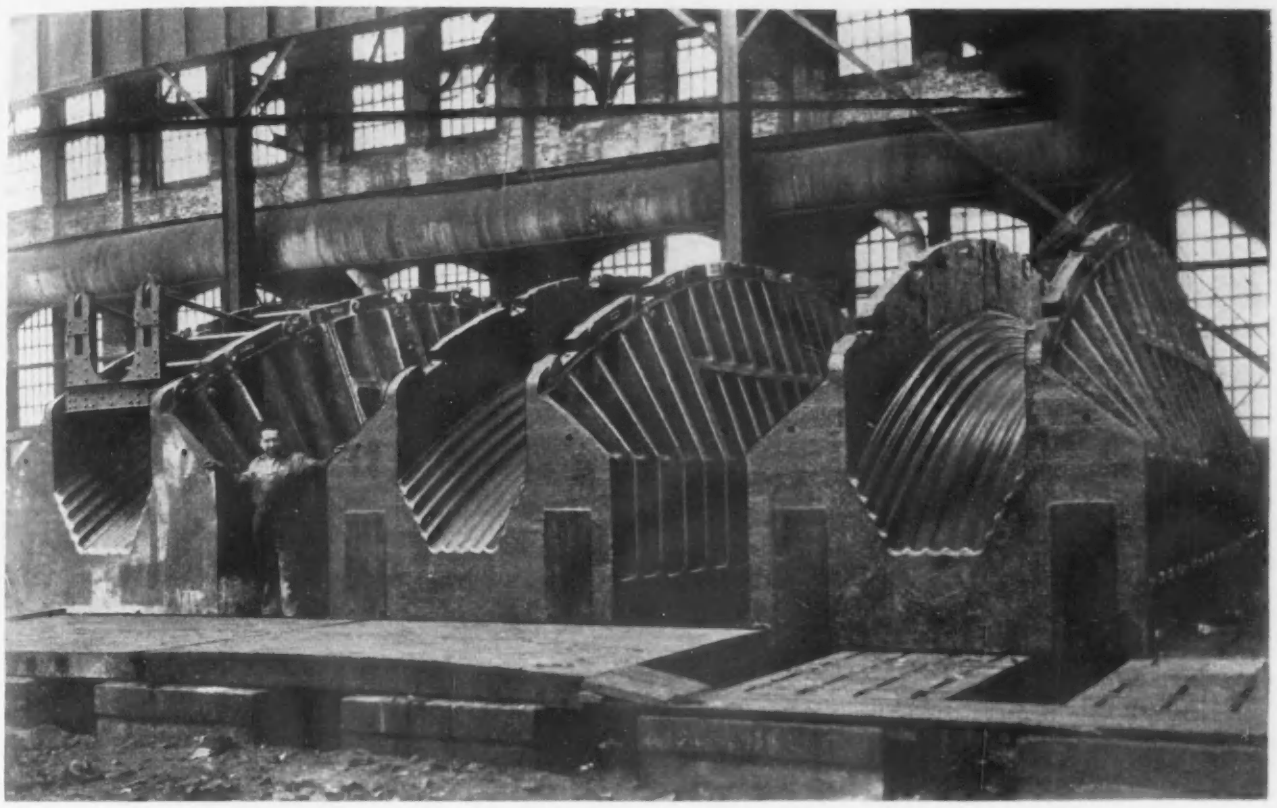
Holding the Metal in Its Place

Side thrust from the molten metal, in a casting of the size of those here described, is enormous. At the bottom, with a 17-ft. head of metal, the pressure reaches 7600 lb. on each square foot. To absorb this thrust each flask was surrounded by heavy timber struts, as shown by sketch. These were wedged in place in such manner as to transmit the thrust to the concrete (or other) walls of the pit, backed up, as these walls are, by hard-packed earth. In the largest pit, shown in the sketch, one set of struts was placed from one flask to its mate. All struts were wedged tightly to their work.

Each casting was left in the sand for five or six days, before the risers were burned off. While still hot, it was then dug out of the sand, given a rough sand blast and then run into an annealing furnace before getting cold. Here it was brought slowly up



Pouring one of the castings.



Three of the saddles completely machined. The one at left shows some of the gear in place which was used in spinning the cables.

to 1650 deg. F.—a "light heat," to prevent cracking when cooling. It was left five days in the furnace to cool, after heat was turned off.

Cleaning these castings was a particularly "special" job, because of the rigid inspection. Every speck of sand had to be removed from every inch of surface, ribs and all, in the search for incipient cracks. Consequently, each casting received almost a grind finish over all surfaces. As the pockets between ribs are only 14 in. wide and reach in some cases to about 6 ft. in depth, the arduous nature of this cleaning will be appreciated.

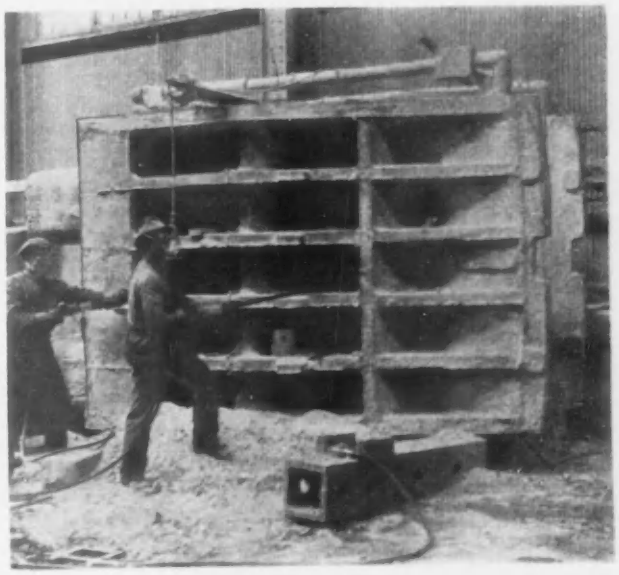
Further Inspection After Final Anneal

A final anneal for five days, again at 1650 deg. F., was followed by complete descaling. This, again, involved going over every inch of surface. Once more the inspectors made careful search for cracks. Then the numerous coupons were cut off and subjected to physical tests. Chemically, these castings are of plain carbon steel, having about 0.25 per cent carbon and 0.50 to 0.60 per cent manganese. Drillings made after final annealing furnished a check in this respect upon the customary ladle analysis of the metal.

In making an exact fit, it was of course essential that the shrinkage on all four castings of each set be identical, or as closely so as it was possible to obtain. This was achieved in part by getting an analysis of steel so closely to specifications as to leave no room for variance in its shrinkage qualities. But the main consideration here was temperature. Pouring at 3000 deg. F., each pour was started at the same point as each other pour, to obtain the desired result.

It need not be assumed that all of this procedure and schedule of manufacture grew overnight, like Jonah's gourd. Much was learned as the work progressed. In particular, short cuts in the time element were discovered which made it possible to speed up a great deal of the preparatory work. Near the end of the program castings were being turned out on a regular schedule of a set of five every two weeks.

In the second and concluding installment of this article some of the principal machining problems will be outlined, and a description of how they were met.



Cleaning sand from one of the castings. Sinkheads or risers will be noticed behind the man at left. Gates showing openings into the mold appear at top. The right end of casting is the groove to carry the cable; this end was at bottom when poured.

DIE CASTINGS MAKE AND REDESIGNED

AN exerciser made largely of aluminum die castings.

By G. M. ROLLASON
Vice-President, United States Aluminum Co.
Garwood, N. J.

IN the design and construction of many new products, die casting plays an important part. The reason for this is obvious: Today, more attention is being paid to fabricating costs than ever before, and through the use of die castings it is possible to reduce materially the cost of assembly.

The method by which a die casting is made—forcing molten metal under pressure into a metallic mold or die—insures extreme dimensional accuracy. As a result, very little, if any, machining is required. Finishing and polishing operations are simplified because of the excellent surface a die casting possesses. The rapidity with which practically finished material can be fabricated reduces the manufacturers' inventories of raw materials and materials in process. A reduction in the floor space required to manufacture is also frequently an important factor.

Number of Castings Determines Economy of Process

The reduction in fabricating costs must be of sufficient magnitude to justify and offset the initial cost of die equipment. The die casting process is primarily adapted to quantity production work. Since the die cost is distributed over the total number of castings produced, the number of castings required generally determines whether or not die casting is economically feasible. Where a large number of parts are involved, the die cost becomes a small fraction of the piece cost and makes the piece cost much less than that of a small number of castings produced in sand.

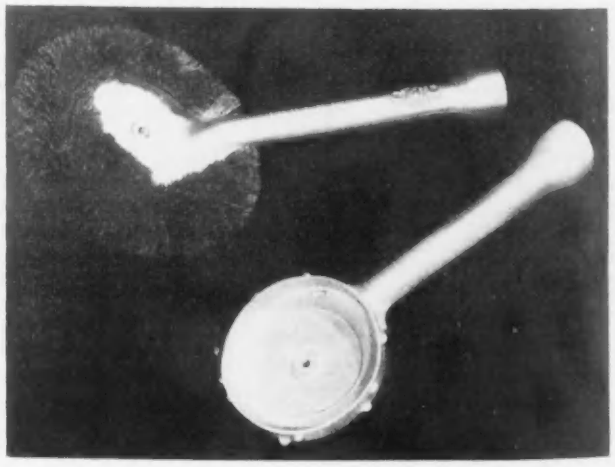
There are, however, other factors to consider in determining the minimum number of pieces which can be produced economically as die castings. Machining costs money; engraving increases fabricating costs. Often, it is cheaper to employ die castings, even though a small number is required, since the saving in machining or engraving cost is sufficient to offset the higher die cost on a piece for piece basis.

Lead, tin, zinc and aluminum-base alloys are used for die-casting purposes. The choice of alloy depends upon the nature of the casting, the properties that are required, its cost and upon the preferences of both the manufacturer and die caster. Because of the individual casting characteristics of the different base alloys, they cannot always be used interchangeably, although they frequently can and are. The same is true of the various alloys having the same base metal.

Ease of Fabrication from Die Castings

In order to show the ease with which various articles may be fabricated from die castings, as well as the adaptability of die castings, the following examples are mentioned. The design of one particular type of fruit press centers around three aluminum die castings, as shown by one illustration: a bowl, a lever and a frame. The lever is attached to the frame by means of a removable pin which acts as a fulcrum. The bowl, slotted to permit the passage of fruit juices, fits into the bowl of the frame. Two bolts hold the frame to a wooden base which rests on four rubber-headed tacks.

The manufacturer of this fruit press



THE finished auto washing brush and the light weight handle and housing around which it is built.

POSSIBLE NEW PRODUCTS

DIE castings are finding increasing use where they result in a reduction in the cost of fabricating products. The savings accruing from the use of die castings must be sufficiently large to offset the die cost, says the author. Economies are found in the elimination of machining and finishing operations, and in the reduction of inventories of materials in process which results from the rapidity with which die castings can be assembled into finished products. Die cost is reduced by distributing the charge over a large quantity of castings.

purposely designed it for die casting. An article to be used in the preparation of food should be so designed and constructed that it can be easily cleaned after use; it should, therefore, be as free as possible from crevices and joints in which food can collect. By employing the die casting process these objectionable pockets are eliminated and the cleaning of the utensil greatly simplified.

To employ any other process, or combination of processes, it would be difficult to obtain this advantage; the cost of assembly would also be increased. With the lever, frame and bowl fabricated as die castings there is nothing complicated about the assembly: The holes in the lever and frame which accommodate the fulcrum pin and the bolt holes in the legs of the frame are cored and the slots are cast in the bowl. The only machining operation consists of tapping the two bolt holes in the legs of the frame. The smooth surfaces of the casting permit them to be polished at a low cost.

Al-Si Alloy for Fruit Presses

Die castings for this press are made in the aluminum-silicon alloys because of the non-corrodibility of these alloys in citric acid and because neither aluminum nor its alloys are injurious to the human system. The low specific gravity of aluminum, of course, proves advantageous.

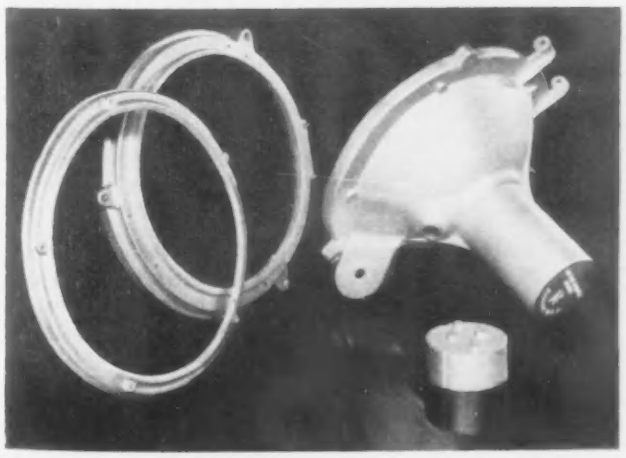
The excellent surface finish of a die casting makes it admirably fitted for various kinds of cases and housings. An aluminum die casting serves in one type of automobile washing brush for the handle and for the housing of a sheet metal turbine, also illustrated. The housing and handle are cast integral. A stationary brush is attached to the outside of the housing while another rotates on the turbine. The handle of the brush is threaded to permit it to be fastened to a water hose. Water coming through the handle hits the blades of the turbine, causing the inner brush to revolve.

But little machining is required in the case of the die casting. The threads which permit the attachment of the brush to the water hose are milled; while the small, elongated hole which allows the passage of water from the handle into the housing is drilled. The hole which carries a bolt to support the turbine is cored. The die casting process makes it possible to cast the trademark of the manufacturer on the handle in sharp, well-defined lines. Obviously the light weight of aluminum dictates its use.

Portable Exercising Machine of Die Castings

A portable exercising machine is an excellent example of the adaptability of die castings. A machine of this nature should be light in weight, strong and enduring. Naturally, this calls for the use of aluminum regardless of the method of construction. A cast frame will have greater rigidity than one fabricated in any other manner, since there are no riveted or bolted joints to loosen. Welding operations are also eliminated. Again, the various lugs and supports can be cast integral.

In the exerciser shown in one of the illustrations, a cast seat operates on hard rubber wheels in a grooved frame. The frame is hinged at the center in such a manner that, when the machine is not in use, it can be



THE adaptability of die castings is well exemplified in the aluminum die cast parts employed in this floodlight.

DESIGNED for die castings, this fruit press is easily constructed and assembled.

folded up and packed in a small case. To prevent the exerciser from marring the floor and from slipping while in use, the frame rests on 26 rubber footpads. The pads are screwed into cored holes in the supporting lugs on the frame after the holes have been threaded. Six springs are attached to the rear of the frame. These may be connected to the seat or handles by means of cord in 12 different tension combinations.

The seat, of course, could be blanked from sheet metal, but by casting it the lugs which hold the wheels can be cast as part of the seat. The same is true of the foot pedal. The design is such that it is better adapted to the casting process. The foot pedal is attached to the frame by means of four die cast levers which make possible a rocker arm action.

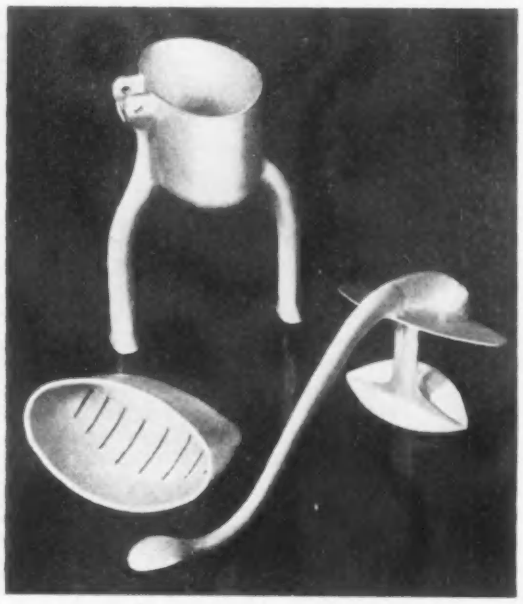
At the outset the castings were produced in sand. But as soon as the project had passed through the experimental stage it was evident that die casting would be less expensive. As developed in die castings, the necessary bolt holes were cored, the cost of machining was reduced and the ornamentation on the castings produced with exacting detail. The die castings had thinner sections, thus making possible a greater saving in weight and material cost. Unquestionably, the trim, business-like appearance which die castings have given this exerciser has added greatly to its sales appeal.

Floodlights Made of Die Castings

Aluminum die castings, because of their rigidity, their ready adaptability to design, their high degree of resistance to atmospheric corrosion and their lightness, are used in the construction of several different types of floodlights. In the floodlight shown in an illustration, aluminum die castings are employed for the housing, the door frame, the lens ring and the focusing tube. The door is hinged to the housing, part of the hinge being cast integral to the housing and part to the door frame. Water-tightness is obtained by means of a tongue and groove joint between the housing and the frame.

The hinged door is clamped tightly to the housing by means of bolts which lock through three pairs of external lugs cast on the door frame and housing. The bolt holes are cast in the lugs; in fact, all of the bolt holes are cored, thus eliminating a drilling operation at the time of assembly. The lens is held in the door frame by means of a ring bolted to the frame. Three splines or keys hold the focusing tube in alinement within the housing proper. The directional ear, which controls the angle of the light beam, is cast as a part to the housing.

The housing, door frame, lens ring and focusing tube for this particular make of floodlight were designed to be produced as castings. By employing the die cast process thinner sections could be obtained than could be produced in sand, thus effecting a saving in metal cost. There are other factors which favored die casting: By means of this process, the holes could be cored; the tongue and groove joint between the door frame and housing and the spline and groove in the housing and focusing tube could be cast more accurately and without the need of machining. As a matter of fact, the die castings required no machining except for reaming and threading the holes. And, as in the case of other projects designed for die casting, the finishing and polishing operations were greatly simplified. A comparison of this floodlight with the one it replaced showed a saving of 50 per cent in labor and 10 per cent in material.



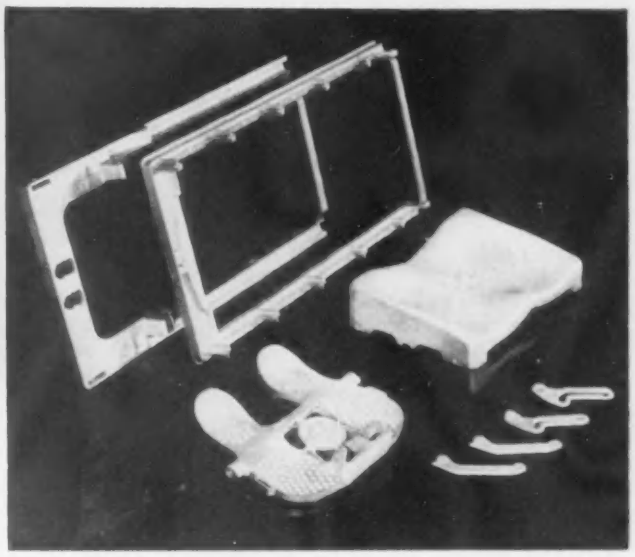
THERE are no crevices or joints in the die cast parts of the fruit press which can collect food during use and complicate the cleaning operation.

Many Industries Use Die Castings

Use of aluminum die castings is not confined to any one industry or type of industry. Their application in washing machines and vacuum cleaners is well known. Other household electrical appliances in which aluminum die castings are used because of their lightness and pleasing appearance includes: waffle molds, polishing machines, fans, heaters, mangles and dish-washing machines. Die castings are also employed in certain types of cooking utensils.

There are many industrial applications of aluminum die castings in electrical machinery and apparatus, For example, batteries, searchlights, floodlights, projectors, telegraph apparatus, radio equipment, fire alarms, telephone apparatus, portable electric tools, cutters, motors, instruments, relays, switches and cutouts are regularly produced with many of the parts fabricated from light alloy die castings. Because of their lightness, rigidity and pleasing appearance, aluminum die castings find a ready application in the frames of typewriters, various types of adding machines and calculators, cash registers and meters.

Another large market for aluminum



THE aluminum die cast parts for this floodlight combine the qualities of rigidity, resistance to atmospheric corrosion and light weight with low assembly cost.

(Right) Sharp, well-defined lines, cored holes, accurate dimensions and smooth surfaces make the assembly of die castings extremely economical. Aluminum die cast parts for an exercising machine.

die castings is the automotive industry. A few of the applications include: Brake shoes; steering wheel post brackets, hubs and spiders; housings, such as carbureter, magneto and gasoline pump housings; instrument parts; step plates; scuff plates; universal joint parts; body pillars; lamp brackets; shock absorber parts; cowl ventilators; distributer brackets; heater parts, such as the register, piping and shutters; hydraulic brake pistons; handles and other fittings.

Only a few of the applications of aluminum die castings have been mentioned. With the possible exception of sheet, no other aluminum commodity has shown a greater diversification of uses. This is particularly noteworthy in view of the fact that the die casting process is one of the newer metalworking processes. But the commercial advance in the die casting industry has been in the direction of lower casting cost and lower fabricating cost. Die castings, because of their high degree of accuracy, their uniformity and superior finish, enable the manufacturer to construct and assemble his product more economically. Small wonder then that die casting as a method of fabrication has entered into so many different branches of industry that today we find many new projects designed for die castings.

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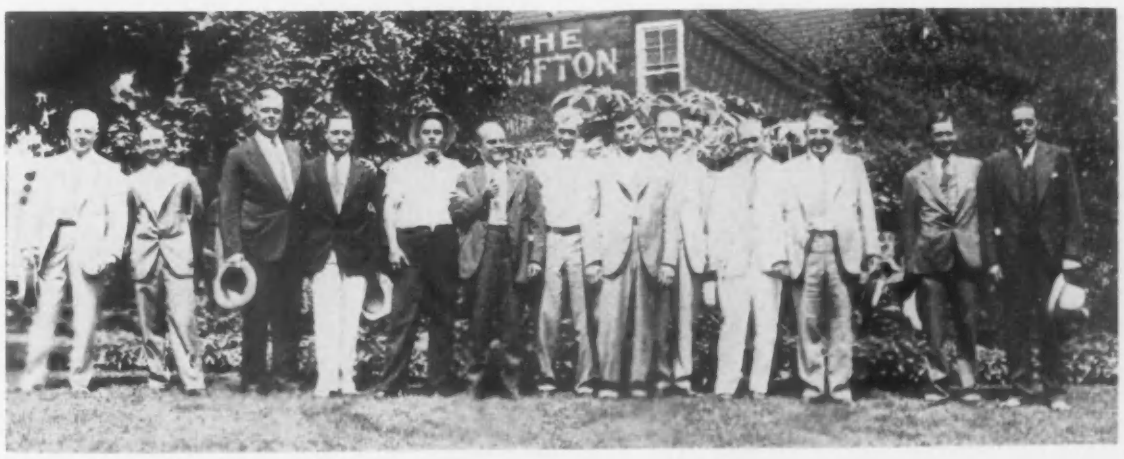
Electric Welders at Niagara Falls



A GROUP of the welding section of the National Electrical Manufacturers Association, photographed at a recent meeting at Niagara Falls, Ont. The USL Battery Corpn., Niagara Falls, N. Y., was host to the electric welder manufacturers here pictured. From left to right they are: Jack Amos, Hollup Corpn.; F. E. Hall, USL Battery Corpn.; J. F. Lincoln, Lincoln Electric Co.; L. P. Hume, General Electric Co.; C. J. Holslag, Electric Arc Cutting & Welding Co.; E. W. Kronbach, Una Welding & Bonding Co.; W. W. Reddie, Westinghouse Electric & Mfg. Co.; L. D. Meeker, General Electric Co.; D. H. Kelly, USL Battery Corpn.; E. D. Bransome, Wilson Welder & Metals Co.; A. A. MacLean, vice-president, USL Battery Corpn.; O. F. Stroman, Westinghouse Electric & Mfg. Co., and J. L. Fosnight, USL Battery Corpn.

NEW BILLET AND ROD MILLS

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IMPROVEMENTS and additions to the Donora, Pa., plant of the American Steel & Wire Co. have been completed and are in operation. The improvements consist of a new continuous billet mill for the Donora steel works and two new double-line continuous rod mills for the Donora wire works, together with auxiliary equipment.

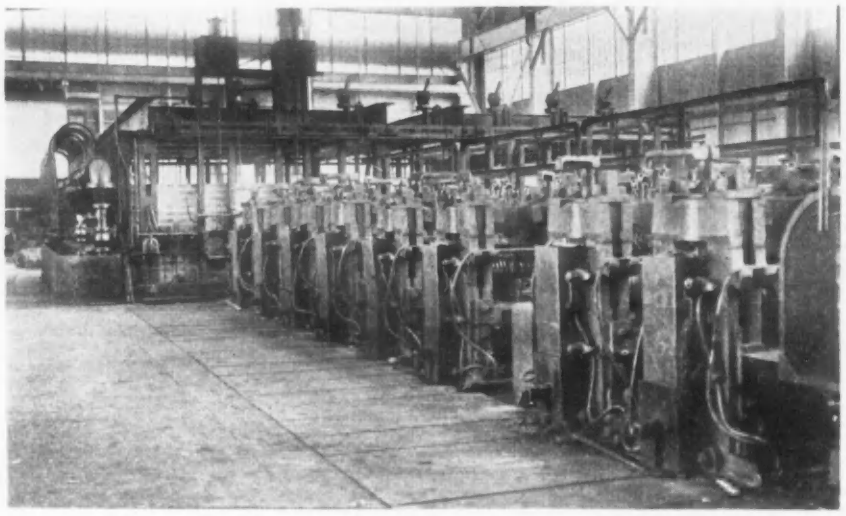
The new ten-pass continuous billet mill takes a 7½-in. square bloom and reduces it to a 2-in. x 2-in. x 30-ft. billet. The square bloom is supplied hot by a 40-in. blooming mill, the bloom being cropped and cut to correct length by a steam-driven down-cut shear. On one side of the shear a depressing table, recently installed, prevents bending of the bloom during shearing. A new slab transfer table has been installed near the depressing table so that, when the blooming mill is running on slabs, they can be conveyed to cars located on a depressed track.

One Continuous Billet Mill

Heretofore the smallest billet rolled by the steel works was 4-in. x 4-in. To take care of rolling 4-in. x 4-in. billets in addition to the 2-in. x 2-in. billets it was necessary to make the new continuous mill flexible enough to take care of both sides. The first six passes of the billet mill consist of a 24-in. train of rolls which reduce the bloom to a 4-in. billet. This billet can be reduced further by four passes of rolls 18 in. in diameter to a 2-in. billet, or it can be transferred to a roller feed table which feeds the billet into a power shear to be cut up into standard lengths of 4-in. billets.

A flying shear located at the proper distance from the continuous billet mill cuts the 2-in. billets to the right length. Power-driven rollers and a skew table are used to separate the billets, if necessary, in accordance with that part of the ingot from which they came. They can be placed on three separate cooling tables, if so desired. The tables have an approximate capacity of 450 tons of billets.

This is one of the highest-speed billet mills in the United States, and has the ability to roll 130 gross tons of billets an hour.



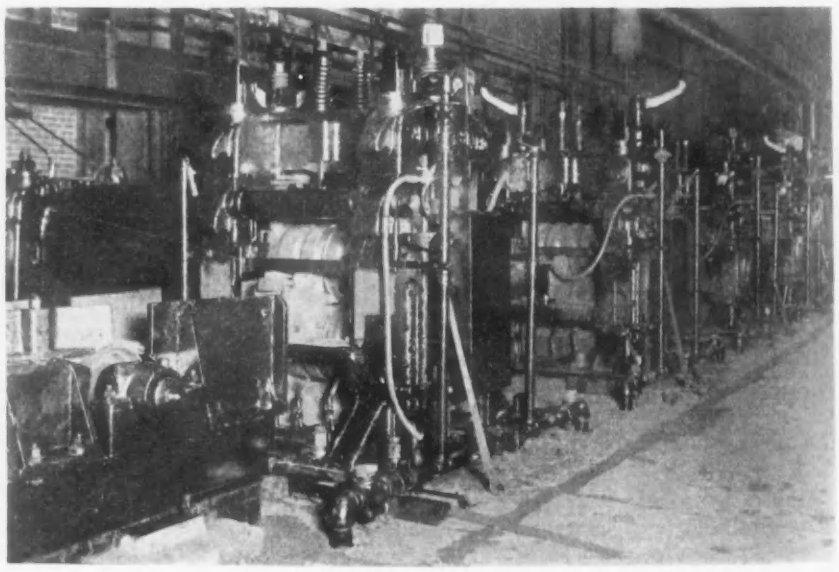
Eight roughing passes of one continuous rod mill, with continuous reheating furnace in background. Steel comes toward the observer, and through a ten-stand finishing mill after leaving the rougher.

Two Continuous Rod Mills

Many novel and interesting features were embodied in the two continuous rod mills.

One rod mill is right-handed and the other left-handed, with the operating sides of the mills facing each other. Each rod mill has a loading skid directly under the billet yard crane, and is supplied by means of the crane. An approach table leads from this skid to the furnaces.

The furnace is of modern design with a flat arch, at present being fired by natural gas. It is completely equipped with a preheater, automatic air control and other automatic regulators. The billets are pushed into the side of the furnace by pinch rolls and pushed down the hearth by suitable arms operating from an electric pusher. By a suitable push-out mechanism, the billets are fed directly to



Delivery end of train of four 18-in. finishing stands in billet mill, this group being fed from the roughing train of six 24-in. stands. Product from this set may be shipped as billets, or run through the rod mills.

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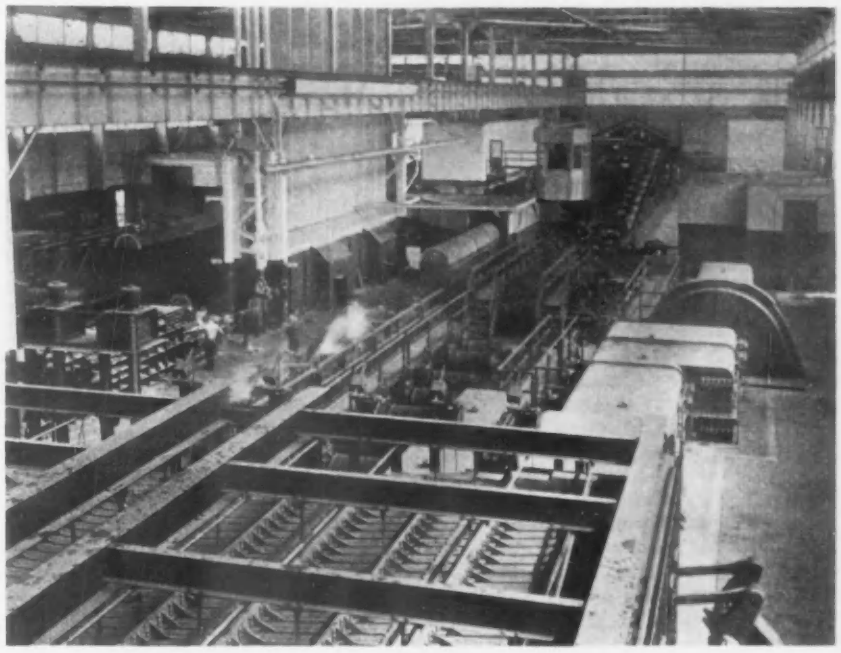
the first set of rolls of the rod mill.

Each continuous rod mill consists of 18 sets of rolls. The bed plates are of rugged and substantial design, being one piece for the finishing mill of ten stands and one piece for the roughing mill of eight stands. The housings, also, are substantial, accessible and adjustable for easy regulation of the mill.

The rod passes from the finishing stand of rolls to revolving reels. To guard against breakdowns and interruption in production, each mill has two conveyors and six reels. By suitable mechanism the rod can be switched to any one of three reels. The reels are of heavy construction; each is driven by its own motor and is completely equipped with automatic controlling devices.

From the reels the coil of rods is pushed off on to a suitable conveyor, which carries the rods away from the mill and delivers them finally on a hook-type conveyor. This conveyor provides uniform cooling and conveys the rods to the storage building, the cleaning house, or the shipping tracks.

The tendency of the trade has been toward heavier-weight bundles, both in wire and rods. The Donora improvements were designed and made to meet this demand and also to anticipate, in the way of still heavier bundles, future requirements along this line. The use of heavier-weight bundles of rods or wire naturally results in decreased manufacturing cost of finished products, due to greater machine efficiency and less amount of scrap. The annual capacity of the two continuous rod mills is about 200,000 tons of rods, ranging in size from No. 5 to 5/16 in. inclusive.



VIEWED from top of reheating furnace, the rod mill roughing stands appear near center (where steam is visible), with their gear boxes at right of steam. Beyond are the finishing stands, followed by up-sloping coil conveyor. Through doorway at left is the duplicate mill.

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Large Oil-Cracking Unit to Be Field Welded

An oil cracking unit, said to be the largest ever built, has been completed by the A. O. Smith Corpn., Milwaukee. Designed to be assembled in the field, this unit consists of a horizontal reaction chamber or precipitator and a vertical fractionating tower.

The reaction chamber is 10 ft. in inside diameter, 67 ft., 7 in. in length and has a wall thickness of 3½ in. to 7½ in. It weighs 404,000 lb. The tower is 8 ft. in inside diameter, 72 ft., 2 in. long and has a 2¾-in. wall thickness, weighing 253,000 lb. A section of the vessel is lined on the inside with a corrosion resisting alloy. The combined weight of the two vessels is 657,000 lb.

The chamber and tower will be welded in the field to form a single vessel in the form of an inverted "T." This joint, according to the Smith engineers, is to be the largest field weld on record—about 25 ft. in circumference and 2¾ in. thick.

This still will be operated at 400-lb. pressure in combination with a temperature of 900 deg. F. The raising of the vessel to this temperature, so high that the steel has a pronounced glow in the dark, naturally produces expansion and considerable movement. To compensate for such movements, Smith engineers have provided spring cushions at the ends (shown in the illustration) and enormous bronze-clad supports at the center, where it carries the vertical tower, permitting a rocking motion by the big shell.

When completed, the unit will have a daily throughput of 5000 lb. of crude oil. The unit will be installed by the Mid-Continent Petroleum Corpn., Tulsa, Okla.

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The annual meeting of the Society of Automotive Engineers will again be held at the Book Cadillac Hotel, Detroit, Jan. 25 to 29. Complete listing of manufacturers whose products conform to the S.A.E. specifications will feature the 1932 Handbook of the Society of Automotive Engineers, soon to be issued.

Field welding, in putting the two heavy chambers together, will cover a 25 ft. circumference of material 2¾ in. thick.

METAL IN GERMAN MINES

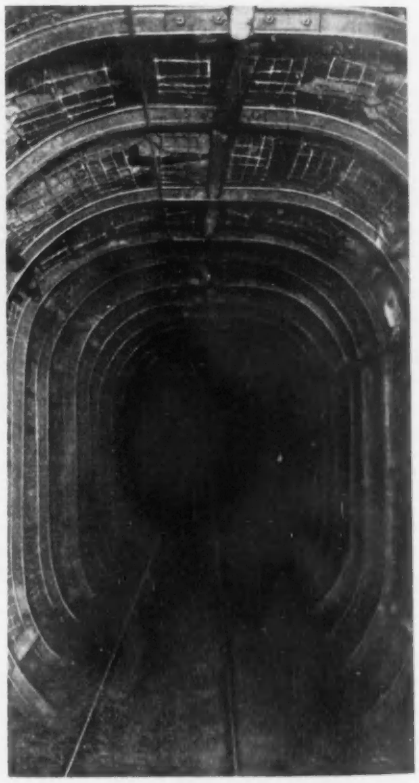
GERMAN coal and iron ore mines have long been users of steel supports instead of wood timbering, the annual tonnage of steel for this purpose showing such a steady increase since 1913 that steel mills estimate it may be possible eventually to dispose of more than 300,000 tons annually for this purpose.

While German mines use more steel than other European countries, probably because they are largely controlled by the steel industry, increased installation has not been accomplished without considerable opposition from the miners and operators, who traditionally favor the timber supports.

Consumption by German coal mines, however, has advanced from about 40,000 tons in 1913 to 95,000 tons in 1927, to 115,000 tons in 1928, to 135,000 tons in 1929, and 1930 is expected to record a further increase, although the final statistics are not yet available. These totals do not include wire netting and other forms of steel annually consumed by the mining industry.

Recently the German steel industry, in cooperation with mine operatives and the Government, has developed standards for steel mine supports, which are generally approved. These require tensile strength of 70 kg. per sq. mm. (100,000 lb. per sq. in.), although most of the steel furnished for mine supports is 72 to 75 kg. per sq. mm. tensile strength. Only in certain sections of mines, where pressures are low, are tensile strengths permitted ranging down to 40 kg. per sq. mm. (57,000 lb. per sq. in.).

Special designs of steel mine supports have been developed, and the accompanying photographs show certain of the methods widely used in German mines, such as the Korfman, the Diplomat and Moll systems, the design furnished by the Oberschlesische Dampfkessel Bedarfs G.m.b.H., Gleiwitz, and an installation for low pressures, in which old rails and wire netting are used.



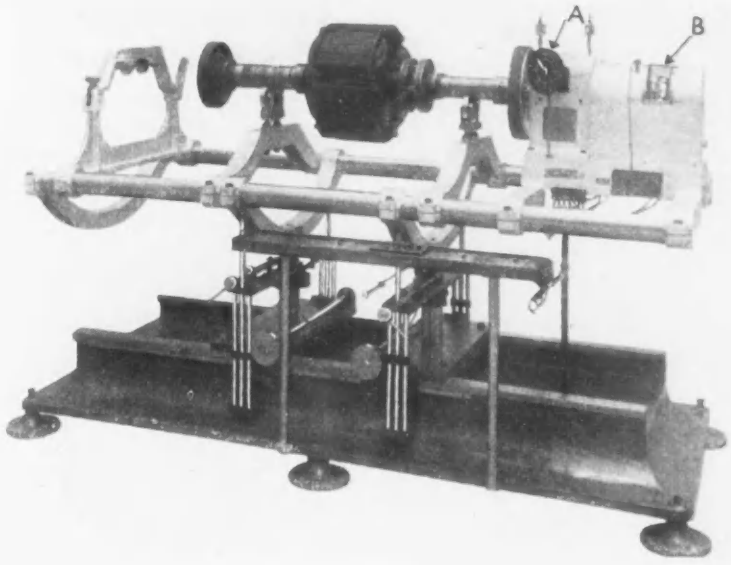
MINE supports (upper left) of the Oberschlesische Dampfkessel Bedarfs G.m.b.H., Gleiwitz, are fitted closely to the wall of the chamber.

(Above) The Korfman system, used for about 20 years in Ruhr mines, usually for high pressure work, has four parts in each section fitted together with special straps fastened by bolts. Under pressure, the steel props compress against the wooden cross supports, giving a maximum contraction of 120 mm. (4¾ in.)

(Upper Right) Old rails and wire netting are used in Upper Silesian mines, where pressures are low and great flexibility of the supporting members is unnecessary.

(Lower Left) The Diplomat system of steel supports is often used for irregular pressures, as it will expand or contract a maximum of 40 cm. (15¾ in.), with average headroom in the chamber of 2.5 m. (8 ft. 2¼ in.)

(Lower Right) The Moll system is used both as illustrated and with wood substituted in the lower section of the uprights, to permit expansion or contraction in excess of 50 cm. under pressure.



Electric Spark Static-Dynamic Balancing Machine

NEW testing machines exhibited by the Tinius Olsen Testing Machine Co., Philadelphia, at the National Metals Exposition in Boston included an Olsen Lundgren electrical spark semi-automatic horizontal cradle type static-dynamic balancing machine thought to be the largest ever exhibited in the United States. Designated as the style S, it is capable of handling rotors weighing from 125 to 1000 lb. and is suitable for dynamically balancing Diesel engine crankshafts, electrical armatures, fans, turbine rotors, rolls, etc. Other sizes of the style S machines will balance rotors weighing from 4 to 15,000 lb.

Rapid operation and close accuracy are features. The operator can see clearly the progress of the balancing operation while the machine is in motion; this is unusual in balancing machines, and aids materially in fast production with accuracy. The machine is easy to operate, simple in construction and has a minimum of moving parts, so that long and accurate service is assured.

Shows Amount of Unbalance

The amount of unbalance in a rotor is determined by adjusting, while the machine is in motion, an artificial unbalance weight until it is exactly equal and opposite to the unbalance in the rotor. Reading of the amount and angular position of this artificial unbalance weight then determines the amount and position of weight to be removed or added to the rotor to balance it properly. Two readings are taken, one at either end, so that a corrective dynamic couple can be applied to the part being balanced.

In the illustration, the part being balanced is an electric motor armature. It is supported on rollers attached to a light but stiff vibrating frame, constructed of high-test aluminum alloy cross members and tubular steel side rails.

At the right end on this vibrating frame is a housing containing an adjustable artificial weight, which rotates on the shaft in line with the part being balanced. This weight can be adjusted to proper angular position and amount until it is exactly equal and opposite to the unbalance in the part being balanced. The entire vibrating unit may be pivoted at either of two points by operating knurled knobs at the front of the machine.

Frame Oscillates on Spring Rods

With the unbalanced part rotating, and artificial unbalance set to zero, the vibrating frame will oscillate horizontally, supported on four vertical spring rods. The motor driving the part being balanced is on the vibrating frame, back of the housing shown at right.

When the left-hand pivot is engaged and the right-hand pivot disengaged, the whole unit will oscillate horizontally around the first pivot as a center. The artificial unbalance weight is then adjusted—by means of four push buttons while machine is in motion and without touching the vibrating unit—until oscillation or vibration ceases. This requires only a few moments. The machine is then stopped and the amount and angular position of unbalance in the armature are indicated by noting the angular position and amount of artificial unbalance weight introduced. This is clearly and definitely given in ounce-inches by marks on the artificial weight at *B*.

Then the right-hand pivot is engaged, the left-hand pivot disengaged, and the part rotated again. The vibrating frame will oscillate until artificial weight is again adjusted to proper angular position and amount, opposite and equal to the unbalance in the armature. Vibration or oscillation then ceases. The machine can then be stopped and reading taken of the amount and angular position of unbalance about the right-hand pivot.

Since the artificial compensating weight is adjusted by the four push buttons on the instrument board while the machine is in motion, the operator can note at all times the effect of the adjustable weight and very quickly bring it to the position desired to compensate exactly for the unbalance in armature.

Sparking Stops at Proper Balance

An electric spark dial *A* indicates the angular position of unbalance in the armature and the angular position of artificial weight *B*. The spark will continue to show until the vibrating bed becomes stationary, at which time sparking ceases, correct balance exists, and readings are taken.

Additional adjustments are provided to obtain the highest degree of sensitiveness when required, or to permit quick readings where outside vibration might disturb the machine temporarily. The main supports and pivots of the balancing frame may be placed in any desired longitudinal position with relation to the two planes of correction in the part being balanced.

After having established the desired axial position of the armature to be balanced with relation to the pivots, the roller-bearing brackets on which the part to be balanced rotates may be located in any convenient position on the balancing frame, independent of position of pivots or spring support brackets, without influencing readings taken from the machine.

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Useful Hydraulic Data

Tabular and other useful data pertaining to the design of hydraulic pressure apparatus have been compiled in a 32-page pamphlet by the Baldwin-Southwark Corpn., Southwark Foundry & Machine Co. division, Philadelphia. In addition to the usual tables of conversion factors, pipe sizes, etc., there are pages listing the flow of fluid through pipe under various pressure differentials; also specific gravities, strength of materials, properties of sections. Another table gives the capacity of hydraulic rams from 1 to 60-in. diameter. The length of straight pipe having fluid-flow friction losses equivalent to that of screwed fittings and valves of various types is tabulated for standard and extra heavy pipe sizes. Graphs facilitate finding the moments of inertia and section moduli of circles, maximum deflections of circular wire springs, and the weight of hollow and solid cylinders.

THREE methods of hand drive, besides motor drive, may be utilized with reverse bend tester at left. The ductility tester (above) has automatic stop.

New Bend and Ductility Testing Machines

A TYPICAL Warner reverse-bend testing machine brought out by the Tinius Olsen Co., Philadelphia, can be supplied in various sizes and types, and either hand operated, as illustrated, or motor driven. It is intended for small rods and flat specimens. Operation consists in bending a specimen back and forth over definitely shaped jaws, so that smooth bending in opposite directions is alternately effected. These jaws have a relatively small radius close to where the specimen is gripped. The two large rollers at top of machine are caused to oscillate back and forth, traveling in a path parallel to the tops of the grip blocks in which the specimen is held.

Fast speed is effected in the hand-operated machine either by operating with the bar at top of machine or with the hand wheel on the large gear at right side. For slower speed, and to provide more power for larger specimens, the hand crank is placed on the pinion spindle. A counter just over the driving gear shows the number of strokes required to complete the test; usually only a few strokes will suffice to break the specimen.

Power Operated Ductility Tester

A new ductility testing machine, made by the same company and also exhibited at the National Metals Exposition, has a motor drive said to be unusually quiet in operation. Power is applied evenly and the load is weighed also by hydraulic means. The cupping tool operating mechanism is similar in general construction to that used on other Tinius Olsen ductility testing machines. At all times during the test the depth of cup and amount of load applied are indicated.

As the material is inserted and clamped in place, the thickness of specimen is shown by the graduated scale under the hand wheel. A stop is provided so that the increase in load is automatically stopped for any desired depth of cup. Then the stop can be instantly released so that the load gradually and smoothly increases up to the specimen fracture at which time both the depth of cup and amount of load are shown.

The depth of cup for initial load may be adjusted to any amount desired. For example, using the 1/16-in. thick specimen, the machine can be set for ¼-in. depth of cup by a device on front of the machine just under the hand wheel. When the cupping tool has produced ¼-in. depth of cup in the specimen, increase in load is automatically stopped and the load is read on the large dial at the front.

By simply moving the small handle on the front of the machine under the hand wheel, the increase in load is again released and the load will continue up to the fracture point of the specimen. As soon as the pointer on the large dial at front stops its forward motion and starts backward, it is evident that fracture has occurred. The maximum pounds indicated by the dial pointer will then be noted. The dial at top of the machine indicates the depth of cup under all loads. After fracture it remains in this maximum position until the specimen is removed.

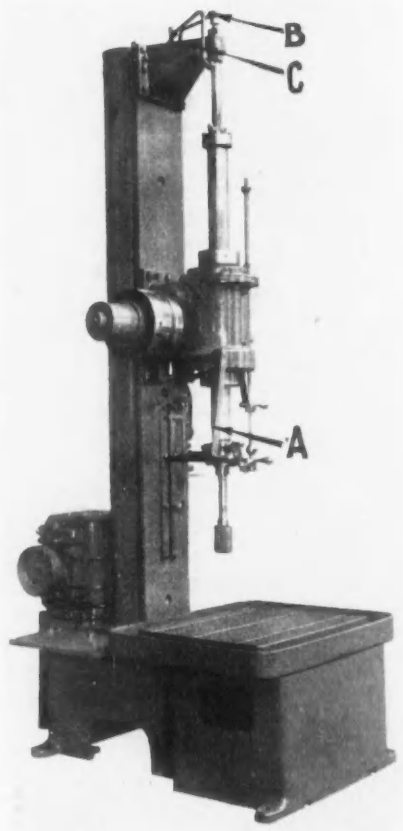
Motor and pump are started and stopped by the lever on top of the pump casing. Pressure is applied, released, or otherwise controlled by lever at the front of the pump housing.

Hydraulic Lapper Has Combination Spindle

FABRICATED steel construction and a combined hydraulic cylinder and spindle feature the No. 13 "Hole Hog" single-spindle lapping and honing machine brought out by the Moline Tool Co., Moline, Ill. The column comprises a 10¾-in. outside diameter pipe to which is welded a piece of 1-in. boiler plate, 12 in. wide and extending the full length of the pipe. The spindle, which is the only reciprocating member of the machine, serves also as the hydraulic cylinder. It is made of seamless tubing, accurately honed.

For controlling the spindle rotation a clutch within the driving pulley is operated by means of lever marked *A* in the accompanying illustration. Power is transmitted from the main horizontal shaft of the driving unit to a worm shaft through slip gears which can readily be changed for different speeds. The worm meshes with a large gear mounted on the sleeve that acts as a driver and bearing for the spindle.

The piston rod is stationary, being held by a bracket at the top of the



column. Like the spindle, it is tubular. Oil enters the piston rod at *B* for the downstroke and at *C* for the upstroke. The spindle stroke is adjustable to a maximum of 24 in. The rate of reciprocation, adjustable by means of a lever, is controlled by an Oilgear motor in the base. Cylinder wear in the driving bushing is taken

up by two adjustable bronze split bushings at either end of the spindle housing which is grease packed to reduce wear. Specifications include: working face of table, 40 x 32 in.; floor space, 60 x 40 in.; size of driving motor, 5 to 7½ hp., depending on the work.

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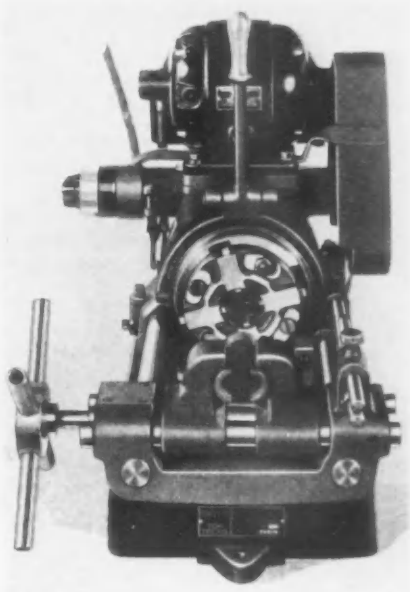
Bolt and Pipe Threader with Rotary Die Head

OSTER MFG. CO., Cleveland, has brought out a new "Tom Thumb" pipe and bolt threading machine equipped with a rotary die head. Regular pipe capacities include all sizes from ½ to 1¼ in., with extra capacities running to sizes as small as ⅛ in. Bolts from ⅜ to 1¼ in. can be handled regularly, while extra capacities include ¼, 5/16, 1⅜ and 1½ in. sizes. The machine can be furnished either as a bolt threader or with special equipment to handle nipples.

A standard thread can be put on 1¼-in. pipe in 18 sec., it is said, and actual floor-to-floor time, including chucking, threading, reaming and removing pipe, required only 30 sec., according to a test report. Equipment includes a stock-stop and an automatic trip which opens the die head when the thread has reached any desired length. A hand trip is also furnished. Drive is through V-belt from a ½-hp. Black & Decker universal, reversible motor. Timken roller bearings are employed.



Pedestal Grinder with V-Belt Drive

MULTIPLE V-belt drive is employed in the grinder here illustrated, brought out by Hammond Machinery Builders, Kalamazoo, Mich., for tool, casting and general purpose grinding. With motor mounted at the rear of the pedestal, this allows for a spindle housing of small diameter that provides considerable clearance between the grinding wheel and the spindle housing. Furthermore, the grinders can be used in tandem and operated at various speeds, not being limited to the r.p.m. of the alternating current driving motor.

The entire spindle assembly can be removed as a unit without disturbing any moving part, an advantage of special value in renewing belts. The spindle is mounted in oversize ball bearings that run in oil and are protected by a double labyrinth seal. Universal adjustable wheel guards and shatterless glass eye shields are standard equipment. The driving motor is

entirely inclosed, but ventilated through a patented motor air cleaner. The grinder can be supplied with wheels of 10, 12, 14 or 16-in. diameter and in 1, 2, 3 and 5-hp. capacities.

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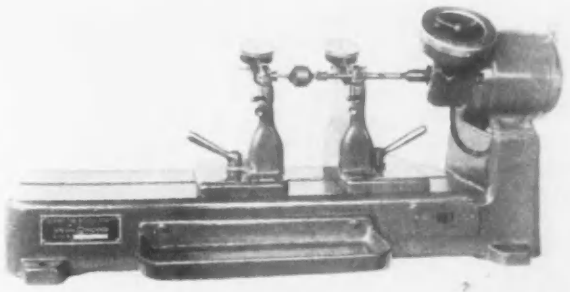
"Heat Treatment of Steels with Cyanides and Salts" is the title of a booklet recently published by the Roessler & Hasslacher Chemical Co., New York. It contains considerable new matter on the use of molten cyanide baths for the lower temperature nitriding of special alloy steels. There are also data on cyanide baths, "case composition, cyanide reheat, mottling, localized hardening, the efficient use of heat-treating salts, etc. All this material is pointed to as based on actual operating results obtained in plant practice and in the company's laboratories.

Dynamic Balancer Employs Neon Locating Light

A NEON light similar to that used on stroboscopes is employed to locate the spot of unbalance in rotors tested at high speeds in a new dynamic balancing machine placed on the market by the Globe Tool & Engineering Co., Dayton, Ohio. Designated as series N and intended to provide high sensitiveness, this machine is an addition to the company's line of production testers offered for dynamic balancing of motor rotors, centrifugal pump impellers, grinding spindles, pulleys, crankshafts, etc.

High accuracy and rapidity are claimed for operation at the high speeds encountered in small series wound motor armatures such as used in vacuum cleaners, electric drills, etc. Only one direction of rotation is said to be necessary, thus saving one-half of the time usually required for dynamic balancing. As the location of the unbalanced force is indicated electrically by the neon light, no pencils or crayons are needed. An automatic reading of the amount of unbalance is given at the same time, the total time required to test the balance of small work being approximately 30 seconds. This reading includes the magnitude of unbalance on both sides of the work as well as its location.

The machine can be furnished in sizes to balance work from 1-in. diameter to 96 in. and for weights ranging from as small as ¾ ounce to 2000 lb. Machines of the same type are obtainable for the special work of balancing ventilating fans—a difficult operation.



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TESTING the high-speed rotor of a small series-wound motor. Larger machines are obtainable for ventilating fan and other heavy balancing work.

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Fabricators Indorse Plan to Stabilize Their Industry

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A PLAN to stabilize the structural steel industry was indorsed in principle by the American Institute of Steel Construction at its ninth annual convention, which was held at the Greenbrier, White Sulphur Springs, W. Va., Oct. 27 to Oct. 30. The resolution of indorsement authorized the board of directors to investigate the legality and practicability of the program and then to take steps immediately to put the plan, or a modification of it, into effect.

The plan, which was presented by C. G. Conley of Mount Vernon, Ohio, provides for the division of the country into local trading areas and the collection of monthly statistics of the tonnage booked for fabrication in each district. The rated capacity of each district in tons, divided by the tonnage booked for fabrication, will be known as the district operating percentage for the month. At the end of the year the operating percentage for the entire country will be computed and fabricators which have run at higher percentages will be assessed extra dues.

Measure Is a Defensive One

The program was described as an emergency measure dictated by the straits in which the structural steel industry now finds itself. "The use of strenuous methods in self defense has ever been recognized under the law as just and proper action in the protection of life and property from injury and destruction," said Mr. Conley. "This industry is face to face at this time with conditions that have already done grievous injury to both its personnel and property and which, unless met and controlled, will drive it to destruction."

The principle on which the plan is based is that every member of the institute is entitled to his proper share of the business available.

As H. A. Fitch, president of the Kansas City Structural Steel Co., Kansas City, Mo., indicated, the old rule of the "survival of the fittest" must be changed to fit modern conditions. He likened the complexities of current competitive relationships to the traffic problems that have developed with the increased use of automobiles. "Do we want to establish traffic regulations? We do—of course we do," declared Mr. Fitch. "And why? Because the traffic lanes are crowded and decent and common sense business policies are a necessity. Remember, also, we obey traffic regulations because we want to and not because we fear the traffic cops."

Responsibility to Labor

The demand for greater stability in the industry was prompted not only by the desire for profitable operations but also by a sense of responsibility to labor and to the community. As Mr. Fitch pointed out, the demoralization of the structural steel market has been due in largest measure to the effort to get orders to provide at least part-time work for employees. "This," he said, "is the major cause for low bidding—almost the only cause for extreme low bidding."

The importance of unemployment relief as a by-product of the plan was also stressed by W. M. Wood, Decatur, Ill., who suggested that the fund built up under the scheme of assessments provided might be used as the basis for an unemployment insurance program for the industry.

The plan contemplates a more com-

Resolution of Institute Asking Modification of Anti-Trust Laws

WHEREAS, many concerns in this, as well as other industries, are facing severe financial difficulties and perhaps insolvency in the near future, partly at least, because of the present legal restrictions on industrial cooperation, and

WHEREAS, any future prosperity of this country is primarily founded on the welfare of communities all over this land directly dependent upon local industries, and

WHEREAS, American industry must be able to discover at once the steps that may be taken without fear of prosecution, to correct this condition, and

WHEREAS, legislation will be introduced in the next session of Congress to amend the present statutes relating to trade and commerce, now therefore be it

RESOLVED, that this convention record itself as favoring any modification of the existing anti-trust laws as will permit agreements in industry tending to limit over-production in any line of endeavor, and be it further

RESOLVED, that this convention instruct the board of directors of the American Institute of Steel Construction to support with active effort any proper legislation to attain this end that may be introduced in the next Congress and that the board be ordered to convey the opinion of this industry, at the proper time, to each Senator and Representative and to the President of the United States.

Proposed Stabilization Plan for Structural Steel Industry

Article I

(a) At the adoption of this plan and at the beginning of each year thereafter the assumed annual capacity of each member shall be determined on an equitable basis.

(b) The assumed annual capacity of each member divided by the assumed total capacity of all members will give a certain percentage which shall be taken as the member's fair percentage of the total business.

(c) At the end of each year the above percentage multiplied by the total tonnage sold by all members will determine this member's current quota. For tonnage a member has sold in excess of the above defined current quota the member shall pay to the treasurer of American Institute of Steel Construction additional dues above the established schedule: For the first 5 per cent in excess of his current quota he shall pay $2 a ton; for the second 5 per cent he shall pay $3 a ton; and so on, paying an additional $1 a ton for each additional 5 per cent or part thereof.

Article II

(a) If the director of trade relations or any member has reason to think that a member has submitted materially inaccurate or incomplete reports, he shall report the matter to the executive committee of the American Institute of Steel Construction, who may demand of the member evidence of the correctness of his reports or, if necessary, the executive committee may order an audit of the member's books for the sole purpose of verifying the accuracy of the reports called for in this agreement.

(b) If it is found a member has submitted inaccurate or incomplete reports, he shall pay such additional dues as the executive committee shall direct but not in excess of $5 per ton on the difference between the amount reported and the correct amount. This shall be in addition to any amounts provided for under Article I.

(c) The cost of the audit shall be borne by the member if his reports are found inaccurate; otherwise it shall be borne by the Institute.

Article III

(a) Each member shall keep on deposit with the treasurer at all times the sum of 25c. a ton of his assumed annual capacity, from which the treasurer is authorized to deduct such dues as the executive committee may direct under the provisions of this plan.

(b) Whenever the records of the director of trade relations show that a member has prospective charges against him amounting to 25 per cent of his deposit, the director of trade relations shall notify the executive committee of this fact, whereupon the executive committee may require the member to make an additional deposit if such action seems necessary to insure that propective charges shall not exceed at any time the amount deposited.

(c) The sums deposited by members shall be placed at interest in savings banks or in investments legal for savings banks as the executive committee may direct. The funds, however, shall remain at the command of the executive committee as long as the fabricator remains a member of the institute, and the investments, if any, liquidated to pay charges against the member. The interest or income earned by the sums deposited shall accrue to the member provided all charges are fully paid.

(d) A bond, in lieu of cash, will not be accepted.

Article IV

(a) Members may withdraw only at the end of a yearly period.

(b) Any member intending to withdraw shall notify the executive committee of his intention at least two months before the end of the yearly period and upon withdrawing shall submit all reports required by this agreement. The executive committee, after satisfying itself of the completeness and correctness of the final report, shall accept the member's resignation and return the amount of the member's deposit, less any charges due.

prehensive and more effective code of selling practice.

The present highly uncertain status of the industry's code of trade practice, due to the inconsistent policy of the Federal Trade Commission, was outlined by R. T. Brooks, president, George A. Just Co., New York. "It is high time," he declared, "that some method be evolved so that an industry may discover in advance whether its plan of cooperative operation is objected to by our Government and that, if there be no objection, it may proceed for a period without interference other than such control as is necessary to prevent misuse of the plan."

T. J. Foster, National Bridge Works, also emphasized the need for a more satisfactory code of trade practice. "Many organizations in the steel industry," he asserted, "have passed resolutions without providing for enforcement, and they remained in force only as long as it took one of the interested parties to get to the telephone." Mr. Foster declared that business is not going through an ordinary depression, but is reaping the results of its bad practices. He quoted from a statement made by President Hoover when he was Secretary of Commerce, during the heyday of our prosperity, as follows:

Self Regulation or Government Control

"The advancement of science and our increasing population require constantly new standards of conduct and breed an increasing multitude of new rules and regulations.

"The question we need to consider is whether these rules and regulations are to be developed solely by government or whether they cannot be in some large part developed out of voluntary forces in the nation. In other words, can the abuses which give rise to government in business be eliminated by the systematic and voluntary action of commerce and industry itself?

"If we are to find solutions to these collective issues outside of Government regulation, we must meet two practical problems.

"First, there must be organization in such form as can establish the standards of conduct in this vast complex of shifting invention, production and use. Second, there must be some sort of enforcement. There is perpetual difficulty of a small minority who will not play the game. They often bring disrepute upon the vast

majority; they drive many others to unfair competitive methods which all deplore. Their abuses give rise to public indignation and clamor which breed legislative action."

It was doubtless for the purpose of obtaining means of enforcing the present unenforceable (Group 2) trade practice rules that the institute adopted a resolution, published in full elsewhere, asking for modification of the anti-trust laws.

Want Fair Competition Preserved

It was made clear, however, that fabricators do not want elimination of fair competition. Rather, they regard the measures they propose as imperative to prevent the logical final result of cut-throat competition, which is the elimination of the many and the ascendancy of a few powerful organizations with monopolistic powers.

"There are dangers in monopoly," declared Mr. Brooks. "The European cartel system has by no means been proved a success. We do not desire governmental control of business, nor do we want the suppression of individual initiative. But think for yourselves how beneficial would be a comprehensive plan for the steel industry headed by the mills and running down through the fabricators of the mills' products to the erector who rears the columns to the skies. If we are to be saved, we must have some definite economic planning for the whole trade."

Profits Depend on Cooperation

In discussing the necessity for cooperation in the industry, Karl E. Vogel, Omaha Steel Works, Omaha, Neb., said:

"I am convinced by the records of the past few months that in our industry it is no longer a question of being smart, smarter or smartest—it is much more probably a question of being 'dumb, dumber or dumbest.' . . .

"When all is said and done, a structural steel shop operates at a profit because of just one single reason, and that is because its competition allows it to make a profit. The best and most efficiently operated shop in the world cannot make a profit on a job unless it receives a fair price for it to start with, and a fair price can never be obtained so long as there is a shop that will bid on the work at a price below cost. In other words, profitable operation is possible only with the constructive operation of the entire industry."

Difficulty Is Surplus Capacity, Not Overproduction

The stabilization plan, which is intended as means of making cooperation an actuality rather than a mere talking point, was outlined by Mr. Conley as follows:

"In this crisis and in self defense we have developed a plan, a course of action for the protection of our industry. It is our purpose to present it to this convention in the hope that it will be adopted and the machinery for carrying out its purpose be set up to the end that we may again be permitted to enjoy life, liberty and the pursuit of happiness.

CHARLES N. FITTS
Reelected President

"We can, of course, carry on as free agents to our destruction. We are not permitted, under the law, to act in combination so as to restrain trade. Our hands, when extended to our ailing brothers, are tied by legal restrictions and nature's defenses are denied to us. We must of necessity create a new and adequate defense within the laws.

"During the last ten years the total production of structural steel has increased very materially, but the total profit earned not only has not increased with production, but has decreased until the individual, and in fact the whole industry, are engaged in a veritable struggle for existence.

"The blame for this anomalous state of affairs is most frequently laid at the door of over-development in the industry. Over-development, however, has different meanings in different industries. In coal mining and farming, for example, it means that more goods are produced and held in stock than can be sold. There can be no such over-production in the fabricating industry, as no goods are produced until they are actually ordered, not even the raw material that we take into our fabricating plants is manufactured until we have agreed to deliver, not pounds of steel, but a finished structure.

"Over-production when used in connection with our industry is a misnomer. Our difficulty is an over-capacity. This over-capacity is necessary for the public good. We must be able to handle peak loads at times so that the heavy carrying charges of idle property may be reduced to a minimum. No fabricating shop can operate continuously at 100 per cent of its capacity. It could not keep pace with its commitments. We are not selling a commodity—we are selling service. The commodity is incidental to the work which we perform. We are tailors who cut and fit to measure to the designs furnished us by our customers.

Reserve Capacity Necessary

"The additional overhead cost of a reasonable amount of reserve capacity is one that is and must be paid for by the public for the sake of having the reserve facilities at command. This is not a new principle, as no commercial building or apartment house is financed on the basis of continually renting all the available rooms. All tenants must pay for carrying a certain percentage of vacant space.

"Over-capacity in the fabricating industry, therefore, should not be a cause for profitless operation, and the fabricators and their buying public must recognize that the excess facilities can only be considered as reserve capacities to be used only when justified by the demand. Regardless of what the demand for steel may be during a given period, it is folly for any fabricator to attempt to operate at 100 per cent capacity. But some forget that they owe it to their buying public, this being a service industry, to have available at all times at least a 25 per cent reserve capacity to take care of emergencies. It is the futile striving to keep this extra 25 per cent employed that ruins prices on the 75 per cent to which they are justly entitled.

"Most fabricators recognize this principle in general, but do not apply it on individual inquiries. Another influence at least as potent, particularly in times of depression, is the fear on the part of some that they will not get their share of available business. In order therefore to prevent this uneconomic condition and to provide for reasonable continuity of employment of the labor engaged, this industry must realize its obligation to its personnel and to the public of the country at large and must, for the good of all as well as for itself, take steps to prevent a recurrence of this condition.

"Considerable thought has been given to the following method of cooperation, which is now submitted for further consideration.

Local Associations to Be Formed

"The local associations should be the agency through which the industry should settle its internal affairs and problems and the American Institute of Steel Construction should be the agency through which the industry should deal with the public and the agency to coordinate the work of the local associations, and aid in the establishment of recognized trade practice rules of the industry.

"The entire country might be divided, as soon as possible, into logical districts or areas and a local association be organized in each such district or area. This subdivision of the country into districts should take into ac-

(*Concluded on page* 1218)

OFF THE ASSEMBLY LINE

Detroit Optimistic as Motor Car Production Slowly Gets Under Way

DETROIT, Nov. 2.

WITH the New York automobile show only two months distant, Detroit is in the most optimistic frame of mind in months, despite the fact that little has actually occurred to warrant a more cheerful feeling. Many orders for automobile parts and materials have been placed, but suppliers still are waiting for releases before starting production.

Some motor car manufacturers have everything ready for operations on their 1932 models on any scale desired, but are deliberately holding back because they do not want to show their products too early and run the risk of being eclipsed in the public eye when competitors bring out new cars at a later date. On the other hand, at least a few makers are planning on revealing their offerings sufficiently in advance of the holidays to pick up a share of the Christmas trade.

Among the large builders, Buick probably will be the first to put its new cars on the market. Production already is under way at Flint, which now is the busiest motor car city in the country, with both Buick and Chevrolet manufacturing new models. Keeping abreast of the times yet showing a commendable conservatism, Buick is not likely to fling aside its long-identified characteristics in a rush toward radical changes. It can be said authoritatively that Buick is incorporating in its 1932 cars many features which meet the demand for easier driving, with special attention on improvement in transmission. It has been 16 months since the present Buick was first given to the public, so that special attention centers on what is being done to keep the company next year in its position as the country's third largest producer.

Recent automobile selling campaigns have revolved about free wheeling and floating power, but the 1932 Buick merchandising campaign will have as its theme a new subject which is likely to be as much discussed in the coming weeks as floating power. It is understood that the public announcement of the new car, originally set for about the first of December, has been moved forward two weeks.

Buick will be first important maker to introduce 1932 models. With Buick and Chevrolet in production, Flint is busiest automotive center in southern Michigan.

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Ford Motor Co. has restored $6-a-day minimum rate for ordinary labor, which was in effect from 1919 to 1929. During the 22 months the $7 rate was in effect, increased wage cost the company $35,176,101, or an average of $1,600,000 a month.

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No change in Ford situation, with suppliers waiting on releases of orders before starting production. Chevrolet expected to make 40,000 cars in November.

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Retail motor car sales in September estimated at 125,000 units, with 75 per cent in low-price class.

Chevrolet Slow in Starting

Contrary to general opinion, Chevrolet is not contemplating a program of 75,000 to 80,000 cars in November; about 40,000 would be nearer correct. The gray iron foundry at Saginaw operated three days the past week, melting slightly more than 1000 tons a day. This schedule may not be increased substantially until the middle of November. If this is to be considered a criterion, output this month will not be heavy. It is known that certain manufacturing departments at various Chevrolet plants are not getting under way as rapidly as anticipated, probably because there is no intention of announcing the car until some time in December. Then, Mr. Ford's slowness in starting production of the improved model A probably has been an influential factor contributing to Chevrolet's delay. Meanwhile, available figures for September show that Chevrolet continues to hold a small lead over Ford in new car registrations.

The Ford company has released orders for steel for wheels for the new model, but most other suppliers are waiting on releases before beginning work. It still seems likely that the Rouge plant will be in production on the new car some time this month, but operations are not expected to start until after the fifteenth. The Ford foundry now has been idle three months, the steel plant four.

Ford Returns to $6 Daily Wage

In commenting on reports that it has recently laid off men and rehired them at a lower wage rate, the Ford company says:

> The Ford Motor Co. has not changed its standard wage rate or abandoned its basic wage principle. Its wages remain the highest in the automotive history. The minimum wage now in effect is that paid by the company throughout the so-called "prosperity" period from 1919 to 1929. When the depression came, President Hoover called upon industry to counteract as far as possible the downward tendency. The Ford Motor Co., as its contribution to the betterment of conditions, added an emergency dollar to its wage rate, thus increasing its minimum from $6 to $7 a day. This was done Dec. 1, 1929. Proportionate increases were made to

every employee in every plant. During the 22 months this emergency rate was in operation, the increased wage has cost the company $35,176,101, or an average of $1,600,000 a month. Total payrolls for the 22 months amounted to $397,442,837. Under the system of automatic raises in pay which has been in operation at the Ford shops, the "depression dollar," as the 1929 increase was called, assumed large proportions. The shops three weeks ago returned to the $6 a day minimum for ordinary labor, grading upward in the more skilled jobs. The probationary rule by which a man is hired at $5 a day has been abandoned. In all cases of newly-hired men at ordinary shop labor, the minimum $6 rate will apply at once. Hiring-in, under present schedules, ranges from 75c. to $1 an hour, according to grade of employment.

Plans of Other Companies

Oakland-Pontiac is going ahead slowly on its 1932 work, with many body dies not yet ready. It is believed that the company will not show its models until the New York show, as it did last year. A similar situation is said to exist at Oldsmobile. Work on the new Hudson and Essex cars is scheduled to begin this week, with public announcement set for about Dec. 1. Just what Reo will do is not known, but few changes are expected in its Royale line, which has set the pace for many other cars this year. Nash and Packard, which introduced their present lines during the past summer, probably will retain their current jobs with only slight, if any, change. The Chrysler-owned companies seem in no hurry to begin making new cars. The Dodge foundry has been closed the past month.

Retail automobile sales in the United States during September are estimated at 125,000, with 75 per cent in the low-priced class, 22 per cent in the medium and 3 per cent in the high. The American Austin Co. has introduced a novel sales plan in connection with the bantam Austin, giving each purchaser free gasoline, oil, tire repairs or replacements, greasing service, general repairs and repair parts for one year, or 7500 miles.

By the exceedingly low production of the last two months, automobile companies are giving their dealers an excellent chance to work off current stocks preparatory to introduction of new models. It is no exaggeration to say that the industry in general, so far as dealer stocks are concerned, is in probably the healthiest condition in its history.

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General Electric Workers Accept Relief Plan

By a sweeping majority, the new unemployment relief plan offered to employees of the General Electric Co. has been accepted by them, President Gerard Swope announced Oct. 28 when a tabulation of the votes showed that 89.5 per cent of those employees eligible to vote had cast their ballots and that 97 per cent of these ballots favored adoption of the plan.

The total number of eligibles is slightly more than 39,000. These are employees who are members of the original and basic unemployment pension plan adopted by employee vote Aug. 1, 1930. The number of votes cast thus far for the new plan is approximately 35,000. Voting will continue until Nov. 1 to permit participation by employees who were absent for one or another reason. The result, however, is now assured, as the new plan already has the support of 87 per cent of the total body of eligible employees.

The plan provides for rotation of available work and other means by which hourly-rated and piecework employees on the payroll Nov. 1 may be assured of receiving, during the following six months, not less than the equivalent of one-half of their average full-time weekly earnings up to an average of $15 a week, and their actual earnings in case the latter amount to more than $15 a week.

The unemployment emergency fund of the company, to which those employees earning 50 per cent or more of their average full-time earnings (including all office, administrative and executive employees and officials of the company) now contribute 1 per cent of their earnings will be augmented Nov. 1 by increasing this contribution to 2 per cent, the company contributing an equal amount. The plan has been approved in principle by the board of directors, and, in case these provisions prove inadequate, the board will be asked to authorize additional payments to the fund by the company, without additional payments by employees.

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Says Mass Production Should be Regulated

Weaknesses of American mass production methods have become apparent during the present depression, but they are defects of regulation and adjustment only and not fundamental weaknesses of the system itself, according to R. E. Baker, Arthur G. McKee & Co., engineers, Cleveland, in an article published in *Trade Winds*, the organ of the Union Trust Co., Cleveland.

As the country emerges from the depression, there is likely to be a greatly lessened urge for the rapid expansion familiar in recent years, and a greater need to adjust production to markets and to guard against obsolescence of equipment. "The outstanding fact of our industrial situation," states Mr. Baker, "is that through two decades of rapidly expanding markets industry and its consumers have paid a staggering price for obsolescence. If we have reached a period in which market expansion is to be much less rapid, we will have to weigh each new improvement on the scale of economic advantage, and then look ahead to see what new things will in turn threaten its continued usefulness."

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Wage Settlement Reveals Steady Sheet Prices

For November-December, tonnage rates paid sheet and tin mill workers in Midwestern mills continue at 7½ per cent above base, unchanged from the rates paid the two preceding months. Bi-monthly examination of sales sheets conducted by the Western Sheet and Tin Plate Manufacturers' Association and the Amalgamated Association of Iron, Steel and Tin Workers, revealed an average selling price of $2.40 per 100 lb. on Nos. 26, 27 and 28-gage black sheets shipped during the 60 days ended Oct. 20. This is the average shown two months ago.

The settlement reveals that sheet prices are holding firm since the new price schedules went into effect in July. For the last two months of this year, puddlers will be paid $10.50 a ton, based on a $1.65 average steel bar price.

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New Jersey Steel Treaters Honor a Member

A dinner in honor of its past chairman and nominee for director on the national board of the American Society for Steel Treating was given by the New Jersey chapter of the society to H. D. McKinney, vice-president, Driver-Harris Co., Harrison, N. J., at the Greenbrook Country Club, North Caldwell, N. J., Wednesday evening, Oct. 28. Among the guests, numbering about 40, were A. H. D'Arcambal, vice-president, and W. H. Eisenman, secretary, of the national society, and W. B. Coleman, Philadelphia, and B. F. Shepherd, Phillipsburg, N. J., of the national board. Short congratulatory speeches were made by Mr. Eisenman, Mr. D'Arcambal, the society's next president, and by Mr. Coleman, nominee for vice-president for 1932. Representatives were present from the New York, Philadelphia and Lehigh Valley chapters.

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Foote Brothers Gear & Machine Co., Chicago, has appointed Neille LaVielle Supply Co., 505 West Main Street, Louisville, Ky., as its local representative for gears and speed reducers.

James A. Farrell Doubts Value of Economic Planning for Steel

Head of Steel Corporation Tells Senate Committee of Difficulty of Stabilizing Business in His Industry

WASHINGTON, Nov. 3. — Doubt as to the value to the iron and steel industry of a National Economic Council in long-range planning was expressed by President James A. Farrell of the United States Steel Corpn. last Thursday, when he testified before a subcommittee of the Senate Committee on Manufactures. The subcommittee is taking testimony from prominent business and financial men, economists and Government officials in connection with a bill to set up a Government council to regularize employment and operations, covering "industrial, financial, agricultural and labor interests of the United States."

The bill was introduced at the last session of Congress by Senator LaFollette, chairman of the subcommittee which is conducting the hearing. He proposes to attempt its passage as it stands or in modified form at the forthcoming session. It is meeting with little or no favor, however, at the hands of witnesses and it is not believed it can be passed as now drafted.

Another industrial leader who opposed the measure is President Gerard Swope of the General Electric Co., who expressed preference for the plan of which he is author, which gives to trade associations within industries much to do in regularizing employment.

Mr. Farrell, however, did not think the Swope plan, the Chamber of Commerce of the United States plan and other proposals would be entirely practicable for the steel industry. One point he made was that it is difficult to forecast requirements for the industry. He did record the opinion that trade associations can be very helpful and told of work done by the American Iron and Steel Institute in disseminating facts regarding production, research, etc. But he explained that past experience has made the steel industry "timid" regarding activities that might be considered in restraint of trade. He said, however, some modification of the anti-trust laws might prevent unfair competition and aid unemployment. At the same time, he said that the plan of the National Economic Council might be attempted, but he held fast to the view that an economic planning system could be best done by the industries within themselves, an opinion that was previously expressed by Mr. Swope.

Speaking of welfare work of the Steel Corporation, Mr. Farrell said it had expended $244,316,293 for this purpose during the 20-year period ended June 30, 1931. The steel industry, he told the committee, shows signs of improvement, and plans of the Steel Corporation for increase of operations at some plants were mentioned.

Mr. Farrell made it clear that he was speaking for himself and not for the Steel Corporation. His testimony was good-humored, yet practical, and was given close attention by the committee.

Asked by Senator LaFollette if the United States Steel Corpn. made any concerted efforts to stabilize its operation, Mr. Farrell replied affirmatively and explained what the corporation had done in this direction. In January, 1931, he said, the corporation employed 228,146, while its normal force was said to be 242,050.

"We gave full time and part time to 94 per cent of our employees through alternating work and dividing the time between the men so that each of the 94 per cent of our employees received some wages; it might have been two days a week or three days a week, but we did succeed in giving 94 per cent of our men full time or part time," said Mr. Farrell. "That carried on through February, March, April and May. In June, due to the further falling off in business, we employed 81 per cent; in July, 80 per cent; August and September, 77 per cent, and that figure has been stationary and is now beginning to show upward movement."

Replying to a question by Senator LaFollette, Mr. Farrell said that the Steel Corporation makes efforts to stabilize production and pointed out that output is always facilitated by the amount of business handled.

In 1930, he said, the Steel Corporation expended $16,515,196 in welfare work. In the first half of 1931, the expenditure for this kind of work was $7,788,612 and in the 20-year period from Jan. 1, 1912, to June 30, 1931, the expenditure aggregated $244,316,293.

Difficult to Stabilize Business in the Steel Industry

Attempts to stabilize production of the Steel Corporation, Mr. Farrell said, must take into account the demand. If the plants are operating at 80 per cent of capacity, it was stated, there would be no difficulty, but when production drops to 30 per cent, the Steel Corporation endeavors to allocate orders to the different plants so there is some work in each place, but it is difficult to create business, Mr. Farrell explained. He stated that it is necessary to conform to products and orders, but the Steel Corporation has endeavored to keep its main employees either fully or partly at work, and up to date, Mr. Farrell said, it has been successful.

"Things look a little better in the steel industry at the present time," Mr. Farrell continued, "and I expect 77 per cent of our employees will begin to move up. On Monday we resumed operations at one of our plants that has been idle for a long time, and on Monday next another plant, the Edgar Thomson Works at Braddock, Pa., resumes with about 4000 men."

Mr. Farrell said he had not as yet digested the plan of Mr. Swope to stabilize industry and employment, and explained that, while the American Iron and Steel Institute is spending a great deal of money in research, there are no discussions with respect to regularization of employment or making the production fit the demand, or anything of that kind.

"Do you think that if the institute undertook such functions and activities that it could be of assistance in helping to stabilize production in the steel industry?" inquired Senator LaFollette.

"It might, but unfortunately in the steel industry we are still conscious of the fact that the United States Steel Corpn. spent nine years in the courts, supposedly in restraint of trade. I might say offhand that the people in the American Iron and Steel Institute are very timid about discussing anything that might be considered in restraint of trade," Mr. Farrell replied.

Doubts Success of Swope Plan as Applied to Steel

Mr. Farrell said he did not believe the plan of Mr. Swope and other plans calling for changes in the anti-trust laws to permit trade associations to engage in efforts to stabilize production would be successful in the steel industry. He said, however, the gathering and dissemination of information is helpful because it informs concerns of operating ratios, etc. He said information of this kind is provided by the American Iron and Steel Institute.

Senator Sheppard of Texas inquired if the institute attempts forecasts.

"No, the future is very difficult to forecast, Senator," replied Mr. Farrell. "I think the future is a good deal like charts. The charts that were great yesterday are no good tomorrow, if you will pardon the suggestion."

Adverting to the Sherman law, Mr. Farrell said that he is not in favor of abolishing it. He declared, however, that it might be possible to modify it to some extent so that there

(*Concluded on page* 1198)

... PERSONALS ...

W. C. HEATH, vice-president, Fairbanks, Morse & Co., Beloit, Wis., in charge of all manufacturing, and associated with the industry since 1909, has resigned and on Nov. 1 became associated with the executive staff of the A. O. Smith Corpn., Milwaukee. He is widely known in manufacturing circles for his development of mass production standards. Mr. Heath is succeeded by A. W. THOMPSON, who has been connected with Fairbanks, Morse & Co. since 1920 in executive capacities, most recently as vice-president in charge of Pacific Coast sales. Mr. Thompson is a graduate of Rensselaer Polytechnic Institute, Troy, N. Y., and in 1907 became associated with the George A. Just Co. and later with Westinghouse, Church, Kerr & Co. In 1910 he joined the General Electric Co., having remained with this industry 10 years. During this time he was in charge of the design and development of the Erie works. When he joined Fairbanks, Morse & Co. it was in the capacity of general manager of its branch works in Indianapolis.

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DANIEL SAYRE, professor of aeronautical engineering at the Massachusetts Institute of Technology, was the guest of the Providence, R. I., Engineering Society on Oct. 28.

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FRANK NORRIS, assistant chief engineer of the Liberty Mutual Insurance Co. and nationally known in connection with the safety movement since its inception, will be the guest of the Boston branch of the National Metal Trades Association on Nov. 5 at the Boston Chamber of Commerce. He will talk on "Accidents Don't Need to Happen."

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WILLIAM MILLER, district sales manager of the Atlanta, Ga., office of the Jones & Laughlin Steel Corpn., Pittsburgh, has been appointed assistant manager of sales, tin plate department, with headquarters at Pittsburgh. R. R. GARRISON, of the Atlanta office, has been promoted to succeed Mr. Miller as district sales manager.

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CARY WRIGHT has been appointed manager of the Ideal Furnace Co., Milan, Mich., succeeding EVERETT BETTS, who has resigned. Mr. Wright was formerly with the United States Radiator Corpn.

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W. L. MELLON has been elected a member of the executive committee of the Westinghouse Electric & Mfg. Co., East Pittsburgh, succeeding the late Harrison Nesbit.

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C. T. WINEGAR, director of personnel, Chrysler Corpn., Detroit, has been elected chairman of the board of directors of the Detroit Industrial Safety Council.

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A. A. PROBECK, who has been identified with the welding industry since 1910, has been appointed sales manager of the Federal Machine & Welder Co., Warren, Ohio. He first joined the Federal force in 1912 and five years later resigned to enter the arc-welding field.

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GEORGE K. BURGESS, director of the Bureau of Standards, who is in Emergency Hospital, Washington, suffering from the effects of a cerebral hemorrhage, has shown a marked improvement.

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J. N. REMSEN, for many years with the Central Alloy Steel Corpn., has been made assistant sales manager of the Eastern Rolling Mill Co., Baltimore, Md.

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BENNETT S. CHAPPLE, JR., who has been identified with the American Rolling Mill Co., Middletown, Ohio, since 1928, and recently as executive secretary of the Armco Distributers' Association, has been appointed manager-director of that association, succeeding G. W. BREIEL. Mr. Breiel's duties as assistant manager of the galvanized and long terne sales department necessitated his relinquishment of the managing directorship.

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CLAUDE O. STREETER, mechanical engineer in the power transmission field, has severed his connection in New York and returned to his home at Shrewsbury, Mass. His plans for the immediate future are not determined.

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LOUIS B. LADOUX has resigned as president, director and member of the executive committee of the Universal Pipe & Radiator Co., New York, and its subsidiaries, Iron Products Corpn., Moldy Boiler Co., Travatex Products Corpn. He has resigned also from similar positions with the Central Foundry Co. and its subsidiaries, Central Foundry Co. of N. J., Central Iron & Coal Corpn., Central Radiator Co., Fruin & Walker Co., and has resigned as treasurer, director and member of the executive committee of the Essex Foundry Co. Mr. Ladoux has been identified with this group of companies for 23 years and during that time has had no opportunity to take a vacation. He has no plans for the future other than to take an extended vacation.

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E. M. BUTLER, who has been a member of the sales department, in charge of engineering changes, Edward G. Budd Mfg. Co., Philadelphia, has been promoted to the post of chief inspector of the company. He has been associated with the company for 17 years.

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R. W. COOK, vice-president and factory manager of the Wallace Barnes Co., Bristol, Conn., was scheduled to speak on the theory and manufacture of springs at a meeting of the Providence, R. I., chapter of the American Society for Steel Treating, Nov. 4.

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J. B. STEVENSON has been made central district advertising manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh, and will have charge of advertising in industrial centers of Pennsylvania, Ohio, West Virginia and other States.

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LEONARD J. BUCK, president of Leonard J. Buck, Inc., New York, importer and supplier of ores and raw materials, left New York on the Bremen for a short business trip to Sweden and Germany.

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RALPH W. PAYNE has been appointed district railroad representative in the southeastern States, with headquarters at 613 Fifteenth Street, N. W., Washington, for the American Hoist & Derrick Co., St. Paul, Minn.

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R. J. CHAMBLISS and S. B. GARDINER have been appointed New York representatives, with office at 16 East Forty-third Street, for the Eastern Rolling Mill Co., Baltimore, Md. K. L. SCHUMANN has been placed in charge of the newly-opened Philadelphia office at 1600 Arch Street.

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To Buy Machinery to Make Water Meters

The Pittsburgh Equitable Meter Co., Pittsburgh, is contemplating the purchase of a considerable amount of brass-working machinery for the production of water meters. Included will be a number of automatic chucking and screw machines for quantity production of small parts.

According to W. F. Rockwell, president of the company, "drought conditions in the past two years have emphasized the importance of conserving water supplies, and economy measures being instituted in many communities cannot be carried out without increased metering. While there is little new building at present, many buildings constructed during the past two years have not been supplied with meters because municipal expenditures had to be reduced. As other expenses are now being cut down, additional funds will be provided for meter installations."

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Robert S. Waters, Johnstown, Pa., and William G. Heiner, Pittsburgh, have been appointed receivers of the National Radiator Corpn. Mr. Waters was vice-president and general manager of manufacture for the company, and Mr. Heiner is an attorney. The receivers will continue to operate the business.

No Betterment in Indicated Steel Requirements

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

NO improvement in the indicated requirements of steel consumers is to be detected in the September figures. The "composite demand line" declined at about the same rate as has prevailed during the period since last April. It is the lowest on the record which extends through 1921 and is, therefore, probably at least as low as in 1914.

Steel ingot production also declined last month and in about the same proportion as the composite-demand line. In this case, however, the index remains much above the low level of 1921, and is just about as much above the index of quantity demanded as it has been on the average during the past five months.

In 1921, 1924, and 1927, the steel-production curve fell below the composite demand line, indicating that production had been fully adjusted to requirements. As such a readjustment is not yet indicated, we may reasonably doubt the significance of opinions that a turn has already occurred. "Inquiries" may have been made and even orders booked, but it remains to be seen whether specifications for actual shipments will develop. Exceptional cases may be mistaken for a general development.

The decline in the demand line is the result of new low levels reached by our indexes of railroad freight tonnage, automobile production and agricultural purchasing power. The building index, too, remains but a point or two above the lowest level of the recession. There were fresh declines in miscellaneous manufacturing and in machine tool orders. Only the mining and oil group made any gain in September and that was due to an increase in anthracite coal production and the drilling of unwanted new oil wells.

Has there then been a turn for the better since the end of September?

As to the *railroads*, one may infer from the weekly car-loading statistics that this is highly improbable. The reduction or passing of dividends by important carriers is not consistent with a hope of early improvement.

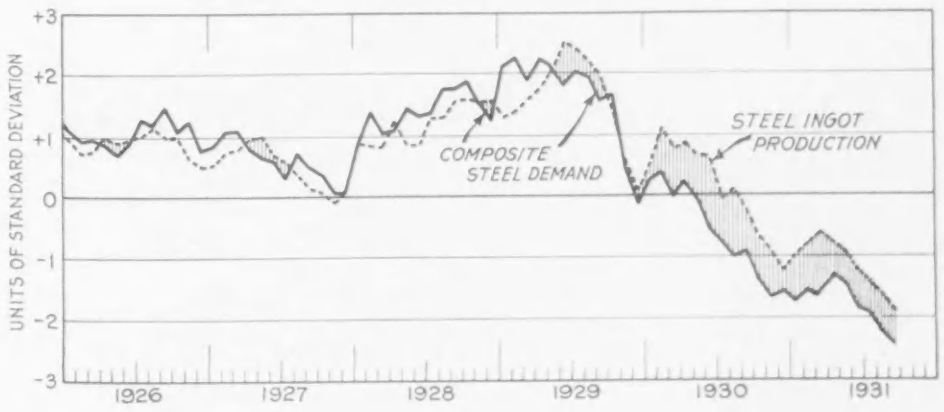
Building activity continues in the doldrums, and such indications as the September declines in permits and contemplated new construction do not suggest an early turn.

Such hopefulnes as exists seems to center on the *automobile industry*. It does seem that automobile production has been thoroughly curtailed and is at a level from which little, if any, further recession of a more-than-seasonal character will be required.

It is difficult, however, to see much prospect of any general expansion this year. Neither orders for malleable castings nor for sheets, nor Detroit employment figures, nor the forced cut in Ford wages, suggests it.

Obviously, there are great limitations imposed upon many *miscellaneous manufactures* when the building and automobile industries are so backward. One of the best indications is found in the position of the machine tool industry. In fact, the sensitive character of this industry is well known and the more-than-seasonal decline in September orders is fairly good evidence that no general expansion in business was likely as early as October. The unseasonable decline in orders for steel sheets in September has a similar significance.

The drilling of *oil* wells has been somewhat stimulated by the artificial maintenance of prices, backed by the militia in certain States. Gasoline prices, however, are very low and the earnings of the oil companies poor. No basis for a sustained improvement in demand for steel is apparent here. The recent recovery in certain *agricultural* prices does not seem likely to go far in view of the supplies on hand, and is maintained only by a large amount of withholding from the market.



COMPOSITE demand has fallen below the 1921 bottom. Steel production also has declined, but remains just about as much above the demand line as a month ago.

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

(ESTABLISHED 1855)

Can Competition Be Harnessed?

AT its annual convention last week the American Institute of Steel Construction indorsed a plan for stabilizing competition and adopted a resolution asking for modification of the anti-trust laws. This action by the steel fabricators may be interpreted by many as merely a reflection of the distress growing out of the depression. But there are others who believe that it has greater significance. They feel that we have reached the end of an epoch and that the old merciless rule of the survival of the fittest must be altered to fit new conditions.

They point out that the preservation of unrestricted competition can no longer be counted on to protect the best interests of the public at large. Competitive building of excess capacity is now seen as an economic waste and as a breeder of industrial instability. "Dog-eat-dog" price cutting is coming to be recognized as a social menace, since it impoverishes stockholders, blights trade, closes plants and throws many out of work, frequently paralyzing whole communities.

It is true that steps to harness competition should be taken cautiously. Prices cannot be fixed in defiance of general economic trends. Moreover, most industries do not want to be reduced to the status of utilities, with prices established under Governmental authority. But there may be an intermediate position between the extremes of unbridled competition and public regulation. There may be a middle ground where the abuses of competition may be eliminated and the security of companies, employees and the public guarded without protecting inefficiency or suppressing initiative. Perhaps, as the steel fabricators believe, it is no longer a choice between black and white. Possibly entirely new concepts are in order to meet the requirements of our complex and interdependent economic system.

One-idea Deflationists

COMMODITY prices in September fell below the 1913 average. One wonders if the extreme deflationists are yet satisfied. Apparently they are not, for they find certain articles still above the pre-war prices. The fact that manufacturing efficiencies of amazing magnitude have been realized in these particulars and yet the companies making the product cannot show profits is nothing to the academician when he sees light between today's prices and those of 1913. He seems to lose interest in those articles which have dropped below pre-war. Instead he would have everything thoroughly down without regard to averages.

He seems to argue about this way: The price average first of all had to fall to that of 1913, although just what is magic or basic about the pre-war average is not clear. Then, after discovering that specific prices have broken through the 1913 level, perhaps through some revolutionary processes making for markedly reduced costs, those higher than the general average, he urges, must also come down. If all specific commodities should then reach 1913 or lower, he will perchance notice that in 1896 we had a nadir of prices.

Let the extremist then argue for a sharp cutting to that level, and he becomes not a deflationist but an arch destroyer who would bring about general bankruptcy. We join with those who with an eye to economic currents would try to steer to shape the course of our destiny, as against the one-idea people who make a fetish of repeating history.

Significance of Car Loadings

FREIGHT-CAR loadings have been almost stationary since the middle of the year, whereas in ordinary times by Oct. 1 they would be running about 15 per cent greater than at the close of June. By the hard and fast rules frequently used in statistical comparisons, all of this divergence would be called a "loss," indicating a corresponding further decrease in general trade activity as measured by this important index. That is by no means certain, however, for we are in a depression and seasonal variations may conceivably be different from usual. In THE IRON AGE two weeks ago reference was made to this matter under the caption "Perils of 'Seasonal Adjustment.'"

Precise figures are given below, for certain periods of this year, with the percentage decrease from averages in the same period in five years, 1924 to 1928 inclusive. The averages are fairly conclusive for ordinary times, the five years, including one with an unusual midyear drop, one with a poor second half and one with an exceptionally good second half.

Freight-Car Loadings Compared

	Weekly Average, 1931	Per Cent Decrease from 1924-1928
First 26 weeks	729,999	22.7
Next five weeks	737,612	24.9
Next five weeks	749,907	28.8
Next five weeks*	737,982	34.5

*Ended Oct. 10. For the separate week following the above presentation, the week ended Oct. 17, there was a 33.2 per cent decrease, representing, for that week at least, a favorable turn.

In reviewing trade in general many observers have remarked of late a complete or nearly complete absence of autumn improvement; there has been little disposition to regard this as other than a fun-

damental loss. Steel production supplies an interesting light on this matter. Measured in percentages it had a spring increase far in excess of anything previously seen, while it lacked entirely an autumn increase. Why in an off year should one seasonal increase be especially marked and another fail entirely?

In freight-car loadings one cannot deny that the absence of seasonal increase in recent weeks indicates that the fundamentals of trade have weakened materially, but it is not necessary to assume that the entire loss shown by the figures comes under that head. With the first 26 weeks of this year running 22.7 per cent under the five-year average, and the five weeks through Oct. 10 34.5 per cent under the average, there is an apparent further loss of 15 per cent, i.e., 65.5 per cent is 15 per cent under 77.3 per cent.

The indicated loss in trade from the first half of the year to the recent period is probably somewhat under 15 per cent. It may be very materially under if motor trucking has lately been taking more business from the railroads than during the first half of the year. It was doing no little then, however.

The showing tends to undermine a theory that at the beginning of the year there were large stocks of commodities—ores, for instance—in consignees' hands, whereby car loadings early in the year would fall short of fully representing the real activity of trade, while as these stocks were liquidated there would be an influence to make car loadings react upward to a normal relationship with trade. The figures carry no significance along that line. Either the stocks did not amount to much or they have not been liquidated, and the best guess is that the influence of stocks was exaggerated.

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A Tariff for Great Britain

IT appears that Great Britain will not impose its intended tariff until after the turn of the year, and there is practically nothing known as to details, except the claim that the underlying theory will be that of revenue rather than protection.

As to iron and steel, there has been an astonishing reversal in the British foreign trade balance this year. In total tonnage of iron and steel, including scrap and excluding iron ore, the first nine months of last year showed 13 per cent excess exports, while the first nine months of this year showed 26 per cent excess imports, the figures being as follows in gross tons:

	1930	1931
Exports, tons	2,646,394	1,582,209
Imports, tons	2,333,536	1,996,208
Balance, tons	+312,858	−413,999

This sudden swing counters the argument which long had force, that Britain had opportunity to export finished products by reason of securing cheap materials, scrap, pig iron and semi-finished steel. The details show that there is a curious mixture. Last year scrap imports exceeded exports, while this year there was a reversal. In pig iron there was a large excess of exports in both years, while in semi-finished steel there have been large imports and scarcely any exports. In the finished products there are wide divergences, making all told a very complicated presentation.

It will certainly be a very difficult matter to arrange a tariff schedule that would represent consideration of details, and it may be found necessary to impose a blanket tariff and take chances.

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A Credit Pool for Factories

MODERNIZATION of our industrial equipment, as a means of both reestablishing vanished profit margins and spreading employment, is accepted by many as a sound principle on which to rebuild American business.

THE IRON AGE has shown conclusively that mechanization, which is a major part of modernization, spreads employment instead of diminishing it. Long term performance, whether over the past ten, twenty, thirty or forty years, proves that the machine gives rise to more placement than displacement of labor. It has also been shown that modernization is a powerful factor in building buying power through increasing the size of the pay envelope as measured in "real" dollars.*

Investigations also made by THE IRON AGE have shown that finance is the bottle-neck in replacement. Many concerns which would gladly install modern equipment, and insure a profit by so doing, are unable to secure the funds for its purchase. Normally these concerns would be considered first class credit risks, and bankers would approve of investments which lead to lower costs of production. But in these days of credit restriction through fear and hoarding, bankers with "liquidity" the watchward have deemed it inexpedient to extend credit either on good credit reputations or for good purposes. They must keep their own houses in order.

The report of the Wheeler committee, of the President's organization on unemployment relief, made public Oct. 29, points to a way out of this impasse. In speaking about the need of releasing certain types of credit among a class of producers "whose number is legion and whose aggregate contribution to the unemployment situation would be very great, if made effective" the report says:

> It may be difficult to organize a private enterprise to cover this particular field, yet it seems quite reasonable if a pool were created to rediscount these secondary classes of paper, the very existence of such a pool would justify local banks to reopen lines of credit and correspondent banks to rediscount the resulting papers.

A modernization credit pool, operating along the lines of the new National Credit Corporation, would make it possible for our manufacturing industries to procede with existing betterment plans now dormant through lack of funds. After all, the commercial paper of profit-making manufacturing plants is better security than the bonds of idle ones.

*"Here Are Some Facts," THE IRON AGE, July 9, 1931; "Dat Ole Debil, Machinery," THE IRON AGE, Oct. 8, 1931; report of committee of U. S. Chamber of Commerce, on mechanization and employment, Oct. 5, 1931.

Economic Planning for Steel Industry

(*Concluded from page* 1193)

could be reasonable competition and reasonable prices, "so that in the final result fair wages could be paid and perhaps a certain amount of stabilization with respect to competition."

Pointing out that he was speaking of unfair competition and not legitimate competition, which he said is a lively thing and is necessary, Mr. Farrell continued:

"Then there is a ruthless competition, and I should think that both in the Sherman law and in the Clayton act it is just as offensive to undersell, sell below cost, as it is for manufacturers to get together and fix prices, and there does not seem to be much attention paid to the first part of that."

He distinguished between industries protected by patents and those not so protected, such as the steel industry, which was said to be highly competitive both within and without the United States. He said the steel industry's situation had been made more difficult by the present tariff law, which put all of its by-products on the free list.

"Of course we feel in the industry that a tariff on iron and steel is a very small matter. There is not enough production there to talk about it very much," said Mr. Farrell.

Opposed to Government Price Fixing

Senator LaFollette asked for Mr. Farrell's opinion of a report by a committee of the Chamber of Commerce of the United States urging modification of the anti-trust laws to permit agreements regarding production and demand.

"I take it you would be opposed to Government price fixing?" Senator LaFollette asked.

"I certainly would," Mr. Farrell replied.

"If the suggestion of others were adopted, would it not mean ultimately that this Government agency (proposed Federal body to supervise plans for balancing production and demand) would have to take cognizance of prices in order to determine whether the public interest is being protected?" asked the Wisconsin Senator.

"Truly," said Mr. Farrell.

Mr. Farrell cited the price control policy of the War Industries Board to show the tendency is to enable every plant, no matter how much higher the cost as compared with the modern plant, to make a profit. He declared that to be the tendency of Government control.

Turning back to a discussion of the Swope plan, Mr. Farrell pointed out that "there is a different gear on different ships."

"Now there is a different gear in different industries," said Mr. Farrell, "and there are some businesses that I would much rather be in than the steel business, and perhaps if I were in some of those businesses I would have very altruistic ideas."

"Do you think of any way to anticipate the demands of your large customers, that is, in the construction industry, the automobile industry, railroads and others?" asked Senator LaFollette.

There are probably some lines of business, Mr. Farrell said, where planning would be a practicable thing. He said that the Steel Corporation produces only on orders and may make up some stock for subsidiaries. But when it comes to outside business, it was declared, it is difficult to estimate.

Economic Planning Impracticable in the Steel Industry

Senator LaFollette asked if Mr. Farrell thought it would be wise to attempt to set up some organization which would endeavor to devote itself to economic planning.

"Well, Senator, I cannot speak for all the industries of the country, but it would be an impracticable thing in the steel business," said Mr. Farrell. "Those situations should be taken care of, in my opinion, within the industry itself. Now that does not mean that some supreme council, or someone else, could not keep a watchful eye over the situation. I have not any definite opinion one way or the other as to the utility of the thing. It might be tried.

"I presume that this plan of Mr. Swope's is being tried in the General Electric Co., manufacturer of electrical machinery, but I should think very effective work could be done through these trade associations. Then you would get to the point of our position in the iron and steel trade, where the sword of Damocles is hanging over our heads, and the Sherman law and the Clayton act."

But the Webb-Pomerene law, Mr. Farrell said, permits manufacturers to do everything in the foreign trade that the Sherman law prohibits in the domestic trade.

Senator LaFollette inquired if Mr. Farrell would favor the same changes being made in the Sherman law so far as domestic production and marketing is concerned that are maintained in the Webb-Pomerene act.

"Speaking for myself alone I would not," replied Mr. Farrell. "The foreign trade is only 10 per cent of the production of the country in the iron and steel business. There has got to be a middle ground in this business so that cupidity does not assert itself."

In this connection, Mr. Farrell spoke of the wide variance in prices during the war of material sold to the Government and its associates and to other interests without restraint before the War Industries Board was set up. He said that if all the things that can be done under the Webb-Pomerene act were available in the domestic trade it would be necessary to have several councils to see that the price was within reasonable limits. Replying to an inquiry by Senator LaFollette as to whether planned public works programs, restricted during periods of prosperity and accelerated during periods of depression, would be a helpful factor in the situation, Mr. Farrell said it would, "provided you could have gotten the appropriations."

"Mr. Farrell, do you think our future lies as much in the foreign trade as it does in the development of the home situation?" asked Senator Sheppard.

"No, but I think both are necessary," replied Mr. Farrell. "I think a certain amount of foreign business is a sort of balance wheel on our domestic trade." He recited development of the iron and steel export market, which he said has become a balance wheel, and predicted that foreign trade is going to be a great balance wheel of the country.

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Finds Infringement of Chromium Plating Patent

A decision in favor of United Chromium, Inc., was rendered Oct. 20 by Judge Edwin S. Thomas of the District Court of the United States, District of Connecticut, in a suit in equity that charged the International Silver Co., Meriden, Conn., with infringement of the Fink patent (U. S. Pat. No. 1581188), relating to the process of chromium plating.

Judge Thomas' findings include the following: "Defendant admits in its brief that it practices the invention described; for example in claim 15 of the patent, and in addition thereto, it withdraws a sample of the solution at intervals of approximately 30 days and analyzes it. If any loss of sulphate radical is noted, it is made up by an additional amount supplied to the solution, thus keeping the percentage of sulphate radical substantially constant. This being the case the defendant comes clearly within claim 15 as limited by the disclaimer filed June 20, 1928. The remaining claims in suit are similarly infringed."

From Pennie, Davis, Marvin & Edmonds, New York, attorneys who carried the case for the defendants, it is learned that an appeal from the decision will undoubtedly be made.

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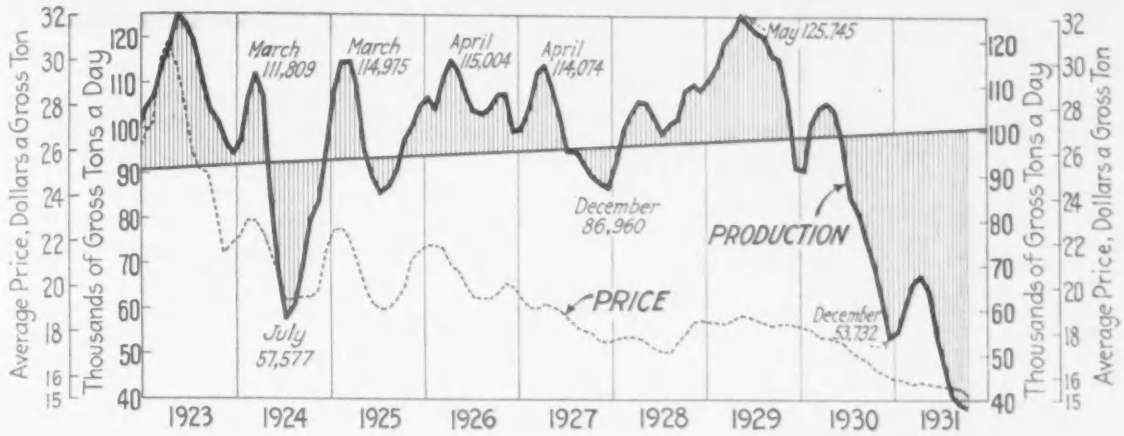
German Furnaces in Blast Lowest in Years

HAMBURG, GERMANY, Oct. 21.—At the end of September there were only 49 furnaces in blast in Germany out of a total of 159 in existence. This is the smallest number of active furnaces reported since the beginning of this century.



Pig Iron Decline Is Tapering Off

PRODUCTION of coke pig iron in October amounted to 1,173,283 gross tons, an average of 37,848 tons daily. The daily figure is the lowest since that for September, 1921. The month's total shows a slight increase, because of one extra day.

Furnaces in operation Nov. 1 numbered 70, against 73 on Oct. 1. They were making iron at the rate of 36,530 tons daily against 38,600 tons on Oct. 1. The number in blast equals the 70 on Sept. 1, 1921, and is the smallest since that date.

Six stacks were started up during October and nine were shut down, the net loss being three, as in September. The Steel Corporation shut down three stacks and did not put any into operation. These included a Donora stack of the American Steel & Wire Co. in the Pittsburgh district, a Farrell stack of the Carnegie Steel Co. in the Shenango Valley, and No. 5 Fairfield stack of the Tennessee company in Alabama. One merchant stack—a Toledo furnace—of Pickands, Mather & Co. was put out in northern Ohio and no merchant stacks went in.

Six stacks of independent steel companies went into operation during October and five were shut down, giving a net gain of one. Those going in included D of the Bethlehem Steel Co. in the Lehigh Valley, A in the Steelton plant of Bethlehem in Susquehanna Valley, an Aliquippa furnace of the Jones & Laughlin Steel Co., and a Monessen furnace of the Pittsburgh Steel Co., both in the Pittsburgh district, No. 2 Hubbard stack of the Youngstown Sheet & Tube Co. in the Mahoning Valley, and a United stack of the Republic Steel Corpn. (Central Alloy) in northern Ohio. Independent furnaces put out included B of the Bethlehem Steel Co. in the Lehigh Valley, Campbell A of the Youngstown company in the Mahoning Valley, one furnace of the Ford Motor Co. in Detroit, one Pioneer stack of the Republic Steel Corpn. in Alabama, and one stack of the Colorado Fuel & Iron Co.

Daily Average Production of Coke Pig Iron

Gross Tons

	1929	1930	1931
January	111,044	91,269	55,299
February	114,507	101,390	60,950
March	119,822	104,715	65,556
April	122,087	106,062	67,317
May	125,745	104,283	64,325
June	123,908	97,804	54,621
½ year	119,564	100,891	61,356
July	122,100	85,146	47,201
August	121,151	81,417	41,308
September	116,585	75,890	38,964
October	115,745	69,831	37,848
November	106,047	62,237	.....
December	91,513	53,732	.....
Year	115,851	86,025	.....

Merchant Iron Made, Daily Rate

1930	*Tons*	1931	*Tons*
Oct.	12,043	April	13,439
Nov.	12,507	May	13,212
Dec.	12,780	June	11,209
1931		July	12,012
Jan.	9,416	Aug.	9,569
Feb.	11,332	Sept.	8,985
March	11,481	Oct.	7,051

Production by Districts and Coke Furnaces in Blast

District	Production (Gross Tons) October (31 Days)	Production (Gross Tons) September (30 Days)	November 1 Number in Blast	November 1 Operating Rate, Tons a Day	October 1 Number in Blast	October 1 Operating Rate, Tons a Day
Buffalo	87,770	97,254	3	2,830	3	3,240
Other New York and Mass.	13,095	13,601	1	425	1	455
New Jersey	.....	.....	0	.....	0	.....
Pennsylvania:						
Lehigh Valley*	43,498	32,645	2	1,025	2	1,090
Schuylkill Valley	14,920	15,447	1	455	1	515
Susquehanna and Lebanon Valleys	15,448	.....	1	500	0	.....
Ferromanganese	.....	.....	0	.....	0	.....
Pittsburgh District	210,436	182,654	10	6,380	9	6,065
Ferro. and Spiegel.	4,044	4,149	1	130	1	140
Shenango Valley	7,987	9,426	0	.....	1	450
Western Pennsylvania	18,402	20,273	1	595	1	680
Ferro. and Spiegel.	6,185	5,970	1	200	1	200
Maryland	48,953	44,245	2	1,580	2	1,475
Wheeling District	107,531	102,194	5	3,470	5	3,405
Ohio:						
Mahoning Valley	97,188	117,197	7	3,130	7	3,680
Central and Northern	111,253	106,682	8	3,590	8	3,740
Southern	26,116	29,753	2	800	2	875
Illinois and Indiana	217,661	223,409	11	6,825	11	6,905
Mich., Wis. and Minn.	24,604	36,524	2	750	3	1,215
Colo., Mo. and Utah	19,486	19,493	1	310	2	650
Virginia	.....	.....	0	.....	0	.....
Kentucky	14,324	13,681	1	460	1	435
Alabama	95,282	95,518	7	3,075	8	3,385
Ferromanganese	.....	.....	0	.....	0	.....
Tennessee	.....	.....	0	.....	0	.....
Total	1,173,283	1,168,915	70	36,530	73	38,600

*Includes spiegeleisen.

Production of Coke Pig Iron and of Ferromanganese

Gross Tons

	Pig Iron* 1930	Pig Iron* 1931	Ferromanganese† 1930	Ferromanganese† 1931
January	2,827,464	1,714,266	27,260	14,251
February	2,838,920	1,706,621	21,310	19,480
March	3,246,171	2,032,248	23,345	27,899
April	3,181,868	2,019,529	27,777	25,456
May	3,232,760	1,994,082	30,296	23,959
June	2,934,129	1,638,627	27,327	11,243
½ year	18,261,312	11,105,373	157,325	122,288
July	2,639,537	1,463,220	17,728	17,776
August	2,523,921	1,280,526	20,909	12,482
September	2,276,770	1,168,915	21,181	14,393
October	2,164,768	1,173,283	24,480	14,739
10 months	27,866,308	16,191,317	241,623	181,678
November	1,867,107	.....	18,619	.....
December	1,665,690	.....	16,288	.....
Year	31,399,105	.....	276,530	.....

*These totals do not include charcoal pig iron. The 1930 production of this iron was 96,580 gross tons.
†Included in pig iron figures.

Ford to Scrap Automobiles Almost One Every Minute

Equipment Costing $500,000, Including 400-Ton Furnace, Hot Metal Mixers and Baling Press to Be Operated Soon

THE Ford Motor Co. is now installing at its Rouge plant a 400-ton furnace, hot metal mixers and a baling press capable of scrapping old automobiles at the rate of almost one a minute. Costing $500,000, the new equipment will increase the capacity of the open-hearth department by 600 tons, bringing the total to 2600 tons every 24 hr.

For the past 20 months, scrap has been secured by wrecking old motor cars purchased and delivered by Ford dealers. The present method is to remove all materials of salvaging value, such as glass, leather and tires, crush the chassis and cut the resulting wreckage to sizes suitable for charging open-hearth furnaces. Under the new arrangement, instead of being crushed and cut into small parts, the chassis will be thrust into a powerful hydraulic press to be compressed into bales. A conveyor will deposit the bales in charging boxes to be emptied into the new furnace.

Will Lower Operating Costs

Following the melting process, the steel scrap will be transferred in ladles to any of nine 100-ton open-hearth frnaces nearby, where it will be mixed with molten pig iron from the Ford blast furnaces. Ford engineers state that the new furnace will lower the cost of operations by reducing difficulties attendant upon the handling of scrap on the present smaller scale. Boilers with a combined capacity of 1100 hp. will use the waste heat from the furnace to generate steam, which will provide power for a 1000-ton shear for cutting heavy scrap. The steam likewise may be diverted to the main steam lines for general plant purposes. The new furnace is of the tilting type, weighs less than 2,000,000 lb. and can be fired by gas, oil or tar.

Heretofore molten pig iron brought from the blast furnaces to the open-hearth department has been stored temporarily in a single mixer situated at the end of the furnace line. This mixer was recently removed and sent to England for installation at the Dagenham plant of the Ford Motor Co. of England. It is being replaced by two storage mixers of the barrel type, each of 600-ton capacity, equipped with the latest type of safety air return engines. Two sets of double-beamed scales so finely adjusted as to weigh from a few pounds to 100 tons will support ladles into which the molten metal will be poured in measured amounts from the mixers to be taken to the open-hearth furnaces.

▲ ▲ ▲

▲ ▲ ▲ OBITUARY ▲ ▲ ▲

CARL A. JOHNSON, president of the Gisholt Machine Co., Madison, Wis., died suddenly at his home on Oct. 30. Apparently in the best of health, and having just returned home from participating in the Governor's Conference on Unemployment Relief, he was seized with a fatal heart attack.

Mr. Johnson was active in a number of industrial and business enterprises and was especially prominent in the machine tool industry. Born in Madison in 1870, he was graduated in 1891 from the College of Engineering of the University of Wisconsin. He became president of the Gisholt Machine Co. in 1908, remaining in that capacity until his death.

The National Association of Machine Tool Builders benefited from the counsel and leadership of Mr. Johnson, who was president of that organization for two consecutive annual terms, the second of which expired last month.

In addition to his lifelong association with the machine tool industry, Mr. Johnson contributed a large measure of time and effort to the broader aspects of both local and national business building. He was the founder and first president of the Madison Association of Commerce; was president, for seven years, of the Wisconsin Manufacturers' Association and was a director of the Chamber of Commerce of the United States. He was also a director of the First National Bank of Chicago and of the Cutler-Hammer Mfg. Co. of Milwaukee.

C. A. JOHNSON

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FREDERICK L. CONRAD, secretary, Moe-Bridges Co., Milwaukee, manufacturer of electric lighting fixtures, died Oct. 10, after a brief illness. He was born in Milwaukee 51 years ago.

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HILTON G. FREELAND, sales engineer at Detroit for the Associated Alloy Steel Co., Inc., died on Oct. 29 after an operation. He was 47 years old. For five years he was chief chemist of General Motors Corpn. and also had been chief metallurgist for the Hoover Steel Ball Co., Ann Arbor, Mich.

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THOMAS SPENCE, president, Rundle-Spence Mfg. Co., Milwaukee, pioneer manufacturer of plumbing and steam-fitting supplies, died Oct. 28, aged 81 years. He was born in Milwaukee. In 1871 he purchased an interest in the Rundle Co., which became the Rundle-Spence Mfg. Co., and was in active charge of the business until illness compelled his retirement six weeks ago.

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JOHN PETERSON, experimental engineer of the American Hardware Corpn., New Britain, Conn., died recently at the Hartford hospital. He was 58 years old.

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GEORGE A. HART, manager of the Melrose Park, Ill., works of the National Malleable & Steel Castings Co., Cleveland, died on Oct. 19, aged 63 years. After graduation from Lehigh University, he was employed by Bethlehem Steel Co. When the National company acquired the Latrobe Steel & Coupler Co., he was made manager.

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C. B. WOODWORTH, manager of the railroad division of the Vanadium Corpn. of America, with headquarters in Chicago, died at his home in that city on Oct. 24, after a brief illness. He was graduated as a mechanical engineer from Purdue University in 1907. He was for a time with the Baltimore & Ohio Railroad and during the war served as captain with the Forty-ninth Engineers. Subsequent to his return to this country he spent several years in South America for the American Locomotive Co. and in 1927 became identified with the Vanadium company as manager of the western division. Mr. Woodworth was 47 years old.

November May Mark End of Decline in Steel Operations

SLIGHT Gain in Production Accompanied by Marked Improvement in Sentiment—Further Automobile Tonnage Expected This Month

A FURTHER slight rise in steel production, mainly in the Pittsburgh district, and a marked improvement in sentiment, resulting partly from rising prices for grains and cotton and the imminence of enlarged automobile manufacturing schedules, have aroused expectations that November may bring a turn in steel operations after a decline that has been continuous since last March. Although the steel industry is restraining its optimism in view of past disappointments, it sees for the first time in months the possibility of better business.

Steel ingot operations are estimated this week at 30 per cent of capacity for the country as a whole against 29 per cent last week and 28 per cent the week before. Further gains are likely to come from automobile tonnage now being released.

The Ford schedule is said to be 65,000 cars for the rest of the year and 70,000 in January and the Chevrolet program contemplates turning out 79,000 during November and December. The Chrysler plants are also ready to start production on new models.

FARM implement manufacturers are much encouraged by the advance in grain prices and may increase output soon if the outlook in agricultural sections continues to improve. Other farm buying of steel and its products may also be stimulated.

A reduction in railroad wage rates would be regarded by the steel and equipment industries as an important factor in the restoration of the buying power of the carriers. Railroad purchases, though lagging far behind seasonal expectations, are featured by an order for 22,000 tons of rails and 3000 tons of accessories from the Louisville & Nashville and one from the Chesapeake & Ohio for 11,000 tons of accessories. Recent rail buying has brought a partial resumption of operations at the Carnegie Steel Co. rail mill, which has been idle for some time. The Northern Pacific has inquired for 150 hopper cars, and two other Western roads are expected to enter the market for equipment.

Building work calling for steel is at low ebb, but a considerable number of projects, mostly of a public character, are soon to be placed. Operations of a Pittsburgh district structural mill have been increased because of releases of steel for the Radio City buildings in New York. Awards of fabricated structural steel, at 20,000 tons, include 7500 tons for a section of an elevated highway in New York.

THE slowing down of the decline in iron and steel output in October is shown by the blast furnace figures, last month's average daily rate having dropped only 2.8 per cent below that of September, while the decline in the latter month from August was about 5.6 per cent. The daily output in October was 37,848 tons against 38,964 tons in September. The month's total of 1,173,283 tons was slightly above that of September because of one more working day. The October daily rate was the lowest since September, 1921, and the 70 furnaces in blast on Nov. 1 also made a new low record since Sept. 1, 1921.

There was a net loss of three furnaces in the month. Three stacks of the Steel Corporation were blown out, and there was also a net loss of one merchant furnace, while the independent companies gained one. For the 10 months of this year the decline in pig iron production has been 42 per cent as compared with 1930.

PRICES of foundry grades of pig iron are unsettled at Cleveland, Pittsburgh and in the Valleys. Concessions of 50c. a ton recently granted by Lake Erie furnaces on outside shipments have been extended to some consumers in the immediate Cleveland territory. Weakness in strip steel prices has not spread to other forms of finished steel beyond the concessions frequently granted on large tonnages. Steel scrap prices, though showing no strength, are generally unchanged.

The Lake Superior iron ore movement for the 1931 season will not exceed 23,500,000 tons, which, with the exception of 1921, will be the lowest total in 27 years.

THE IRON AGE composite prices are unchanged at 2.116c. a lb. for finished steel, $15 a gross ton for pig iron and $8.71 a ton for steel scrap.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron,

Per Gross Ton:	Nov. 2, 1931	Oct. 27, 1931	Oct. 6, 1931	Nov. 3, 1930
No. 2 fdy., Philadelphia	$15.76	$15.76	$16.26	$18.76
No. 2, Valley furnace	16.00	16.00	17.00	17.00
No. 2 Southern, Cin'ti	14.69	14.69	14.69	15.19
No. 2, Birmingham	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*	17.00	17.00	17.00	17.50
Basic, del'd eastern Pa.	16.75	16.75	16.75	17.75
Basic, Valley furnace	15.00	15.00	15.50	17.00
Valley Bessemer, del'd P'gh	18.26	18.26	18.76	19.26
Malleable, Chicago*	17.00	17.00	17.00	17.50
Malleable, Valley	16.50	16.50	17.00	17.50
L. S. charcoal, Chicago	25.04	25.04	25.04	27.04
Ferromanganese, seab'd carlots	†85.00	†85.00	†85.00	94.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Ferromanganese quotations adjusted to carload unit; larger quantities at discount.

Rails, Billets, etc.,

Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	36.00
Rerolling billets, Pittsburgh	29.00	29.00	29.00	31.00
Sheet bars, Pittsburgh	29.00	29.00	29.00	31.00
Slabs, Pittsburgh	29.00	29.00	29.00	31.00
Forging billets, Pittsburgh	35.00	35.00	35.00	36.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.60

Finished Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.93	1.93	1.93	1.93
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.88	1.88	1.88	1.88
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.85½	1.85½	1.85½	1.85½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.00
Hot-rolled strips, Pittsburgh	1.50	1.50	1.55	1.60
Cold-rolled strips, Pittsburgh	2.05	2.05	2.15	2.35

Finished Steel,

Per Lb. to Large Buyers:	Nov. 2, 1931 Cents	Oct. 27, 1931 Cents	Oct. 6, 1931 Cents	Nov. 3, 1930 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.35
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.50	2.50	2.50	2.45
Sheets, galv., No. 24, P'gh	2.90	2.90	2.90	2.95
Sheets, galv., No. 24, Chicago dist. mill	3.00	3.00	3.00	3.10
Hot-rolled sheets, No. 10, P'gh	1.70	1.70	1.70	...
Hot-rolled sheets No. 10, Chicago dist. mill	1.80	1.80	1.80	...
Wire nails, Pittsburgh	1.90	1.90	1.90	1.95
Wire nails, Chicago dist. mill	1.95	1.95	1.95	2.00
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.35
Barbed wire, galv., Pittsburgh	2.55	2.55	2.55	2.60
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.75
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.00

Old Material,

Per Gross Ton:				
Heavy melting steel, P'gh	$10.12½	$10.12½	$10.25	$13.75
Heavy melting steel, Phila.	8.00	8.00	8.25	11.50
Heavy melting steel, Chicago	8.00	8.00	8.00	10.50
Carwheels, Chicago	9.00	9.00	9.50	12.50
Carwheels, Philadelphia	*11.50*	12.00	12.00	15.00
No. 1 cast, Pittsburgh	10.00	10.00	10.00	12.75
No. 1 cast, Philadelphia	*10.50*	11.50	11.50	12.00
No. 1 cast, Ch'go (net ton)	8.50	8.50	8.50	10.00
No. 1 RR. wrot., Phila.	*9.50*	10.00	10.00	14.00
No. 1 RR. wrot., Ch'go (net)	6.50	6.50	7.00	9.00

Coke, Connellsville,

Per Net Ton at Oven:				
Furnace coke, prompt	$2.40	$2.40	$2.40	$2.60
Foundry coke, prompt	3.50	3.50	3.50	3.50

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	7.37½	7.37½	7.37½	9.62½
Electrolytic copper, refinery	6.75	6.75	6.75	9.25
Tin (Straits), New York	22.25	22.87½	22.25	25.75
*Zinc, East St. Louis	*3.15*	3.25	3.57½	4.25
Zinc, New York	*3.50*	3.60	3.92½	4.60
Lead, St. Louis	**3.80**	3.62½	3.82½	4.95
Lead, New York	**4.00**	3.75	4.00	5.10
Antimony (Asiatic), N. Y.	6.50	6.50	6.55	7.12½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

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▲▲▲ The Iron Age Composite Prices ▲▲▲

	Finished Steel	Pig Iron	Steel Scrap
Nov. 2, 1931	2.116c. a Lb.	$15.00 a Gross Ton	$8.71 a Gross Ton
One week ago	2.116c.	15.00	8.71
One month ago	2.116c.	15.34	8.83
One year ago	2.135c.	16.29	11.92
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1931	2.142c., Jan. 13	2.102c., June 2	$15.90, Jan. 6	$15.00, Oct. 27	$11.33, Jan. 6	$8.71, Oct. 27
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

Pittsburgh Ingot Rate Up to 30 Per Cent —Further Improvement Expected

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PITTSBURGH, Nov. 2.—Further increases in raw steel production in this district and a widespread belief that November will bring an improvement over the preceding month to the steel industry are the outstanding developments of the week.

While steel company executives are hesitant in making predictions for even a month in advance and are reluctant in saying that the recent spurt in operations indicates a definite upward trend, they feel that most of the factors now affecting general business are constructive and that the steel industry must certainly reap some benefits.

Most of the expectations for heavier releases in November are based upon the probable performance of the automobile industry. Orders placed from this source last month are still being held back, but evidence is appearing daily to indicate that increased specifications may come at any time. Shipments to the automobile body builders have already picked up and movement of steel to parts makers reflects scattered gains. In addition, the motor car makers themselves have made promises regarding their needs which cannot be entirely discounted.

Increased prices for cotton and wheat have also brought improved sentiment to the agricultural districts, and some farm implement companies which had not expected to start their plants before the first of the year are now revising their plans. Jobbers of merchant wire products in the South and West are also showing more interest in their stocks.

While business from the railroads is still decidedly limited, the local mill has received enough releases on rails and accessories to resume operations in a limited way for at least two weeks. Tin plate makers are maintaining production on anticipated tonnage, and the only important industry which continues to reduce its needs is building. Less structural steel and reinforcing bar tonnage is coming out, but production against old contracts is holding its own.

Steel ingot production in the Pittsburgh district this week is estimated at 30 per cent of capacity, a gain of three points over the preceding week and of five points over the rate prevailing during the greater part of October. One large plant which has been inactive for two months has resumed production in a limited way, and output has been increased at two other important producing points. Operations of the smaller independent companies have been maintained. Ingot production in the Valleys is up slightly, but is still slightly under 30 per cent. A blast furnace in that territory has been banked. Wheeling district production is holding.

Ingot production of Pittsburgh gains three points to an average of 30 per cent.

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Although not making predictions, steel companies look for further moderate gains this month.

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Heavier releases from automobile industry counted upon to lift operating schedules.

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Increased prices for wheat and cotton may bring quicker resumption of manufacturing by farm implement companies.

* * *

Pittsburgh district rail mill, idle for some time, has resumed for at least two week's run.

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Prices of both finished steel products and raw materials have been maintained. The foundry grades of scrap are weaker, but heavy melting steel has a firmer tone, reflecting increased steel output.

Pig Iron

Shipments against contracts last month averaged somewhat better than in September with some makers, but new buying showed no improvement. Current purchases are generally in carload lots, and prices are rather unsettled. In the Valleys, quotations made by makers depend entirely upon the competition encountered from Lake furnaces, and some figures appear which are not considered representative of the general market. Outside competition is not so much of a factor in the immediate Pittsburgh territory, and the local prices are fairly well maintained. No sales of basic are reported, and the price is nominal at $15, Valley furnace, or $15.50, Pittsburgh district furnace.

CURRENT MARKET PRICES FOR STEEL, PIG IRON AND OLD MATERIAL WILL BE FOUND ON PAGES 1212 TO 1216, INCLUSIVE.

Semi-Finished Steel

Aggregate shipments of billets, slabs and sheet bars during October showed little improvement over those of the preceding month. However, the prospect of higher production by non-integrated sheet and strip makers this month promises slightly heavier movement. The price continues nominal at $29, Pittsburgh or Youngstown. Wire rods are quiet, but prices are fairly well held at $35, Pittsburgh or Cleveland.

Rails and Track Supplies

The Chesapeake & Ohio is reported to have placed about 4000 tons of rail joints, and will close this week against the remainder of its inquiry for track accessories. New inquiry for both rails and accessories is light, but sufficient releases on rails have been accumulated to bring about the resumption of production by the local rail mill, which has been idle for about two months. Initial output will average about 30 per cent of capacity, and present orders assure at least two weeks' operation, with the prospect of a further extension at the end of that time. During the last week or two a slight improvement in demand for light rails from mining companies has been reported.

Bolts, Nuts and Rivets

While specifications show no material gain, there is some prospect of larger tonnage during November. It is indicated that railroad purchases may increase, and the automobile industry also gives promise of heavier buying. Prices on bolts and nuts are somewhat more stable than they were. Large rivets are holding fairly well at $2.25 a 100 lb.

Bars, Plates and Shapes

Production of structural steel has risen slightly in the last week, largely because of advanced production on large orders placed earlier in the year. Current awards are at a low rate and are still confined largely to public works. A falling off might be expected at this season, but the backlogs of the larger fabricators are sufficient to assure some activity during

the winter. Demand for plates shows little improvement, and prospective barge purchases give the most promise for early gains. Barge inquiries are rather heavy for this season, and much of the business is likely to be placed before the end of December. Little demand for plates is coming from the railroad car builders, but the Norfolk & Western will make repairs to 500 coal cars in its own shops, requiring a substantial tonnage of steel. Specifications for merchant bars show little improvement, but automobile parts makers have increased their requirements of alloy steel bars slightly.

Prices on the heavy hot-rolled products are still holding fairly well at 1.60c., Pittsburgh, on current small orders. Large tonnage of structural steel and reinforcing bars continue to develop sharp concessions.

Cold Finished Steel Bars

Some makers report a slight gain in releases, but improvement is spotty and restricted to isolated cases. Substantial specifications from the automobile industry are still lacking. The price is well maintained at 2.10c., Pittsburgh.

Tubular Goods

With pipe line tonnage generally lacking, the market for tubular goods in general is rather dull. Mill operations in Pittsburgh and the Valleys have held their own in the last week, but are running considerably under September and early October averages. Demand for standard pipe is steady, and the coming of colder weather has brought some improvement to the movement of pipe for heating purposes. New buying by oil companies is restricted as drilling operations in the mid-continent fields are light. Mechanical tubing is quiet, but demand for boiler tubes is making a comparatively good showing.

Wire Products

With October movement of wire products showing some gain over the previous month, some makers expect a further increase in November. Jobbers in the South are increasing the number of their orders, but individual releases are very light. One or two makers of automobile wire wheels have stepped up their needs slightly. The firmness of prices is one of the most favorable factors in the market, as manufacturers' wire is well maintained at 2.20c., Pittsburgh, and nails are no longer available at less than $1.90 a keg.

Sheets

Continued postponement of releases on sheet steel from the automobile industry has again prevented any marked change in business during the last week. In exceptional cases specifications are coming from body builders and a few other consumers, but there has been no substantial increase in orders which would indicate that the automobile companies are finally getting into production on their new models. Sheet tonnage from other sources is just about holding its own, and production continues at about 30 per cent of capacity. Output of full finished sheets is averaging a little higher.

Sheet prices have not been subject to any pronounced weakness in spite of the recent decline in strip steel. Automobile body sheets are holding except in two or three cases at 3.10c., Pittsburgh, and such shading as is encountered has been in the form of extensions of old contracts which had not been entirely ordered out. Hot-rolled sheets are quoted at 1.70c., Pittsburgh; hot-rolled and annealed at 1.85c.; hot-rolled annealed, No. 24 gage, at 2.40c., and galvanized sheets at 2.90c. Tin mill black plate is fairly well maintained at 2.65c., Pittsburgh, on such new business as is being booked.

Tin Plate

The increase in production reported last week has been maintained, and the average for the industry as a whole is now closer to 50 per cent than to 45 per cent. Improved output of anticipated tonnage by three or four larger makers is the principal cause of the gain. Contracting for 1932 is still slow with a number of buyers, but makers are not pressing for orders.

Strip Steel

Makers of both hot and cold-rolled strip steel are revising downward the contracts of their larger customers in line with a $1 a ton reduction on hot-rolled strip, and $2 on cold-rolled. New quotations are 1.50c. and 1.60c., Pittsburgh, on hot-rolled material, and 2.05c. on cold-rolled. Efforts are being made to hold smaller users to 1.55c. and 1.65c. on hot-rolled strip, and 2.15c. on cold-rolled. Improvement in releases on strip steel is very restricted, and only a few makers seem to have benefited. However, sentiment in the trade is better, and clarification of the price situation may stimulate business to some extent. Production continues at a very low rate, with the industry running at about 25 per cent on hot-rolled material, and 20 per cent on cold-rolled.

Coke and Coal

Heating coke continues in fair demand, but the other grades are very slow. Shipments of foundry coke are sufficient for about one day a week's operation on the part of consumers. Furnace coke is also dull, but the price is unchanged at $2.40, Connelsville. The coal market also reflects seasonal improvement on domestic grades. The price on domestic lump will be advanced to $2 a ton in the near future. Slack prices are still very weak.

Old Material

The scrap market has been unusually quiet in the last week, a condition which is usually encountered immediately prior to the closing of the monthly railroad lists. However, a mild improvement in steel-making operations in the Pittsburgh district has given the dealers some encouragement, and the market has not lost ground since recent minimum quotations were reached. It is still difficult to buy heavy melting steel at less than $10, but mills have not boosted their offering price. The foundry grades have lost additional ground, with shipments decidedly limited, and little new buying reported. Blast furnace scrap is lower. The monthly list of the Baltimore & Ohio, on which bids were taken Nov. 2, contained only 3000 tons of scrap.

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Buffalo Steel Plants Operating at 35 Per Cent; Some Pig Iron Sales Made for Canal Shipment

BUFFALO, Nov. 2.—There is a little flurry of demand for pig iron for barge canal shipment. Local producers have booked several 100-ton orders to be sent by the canal before the close of navigation Nov. 15. District business is quiet, with only carload lots being ordered. Foundry operation is about 25 to 30 per cent.

Finished Steel

The Lackawanna plant of Bethlehem Steel is operating eight open-hearths, although some change in this schedule may be made during the week. Republic Steel is operating three open-hearths. Sheet business shows some improvement, and Seneca Iron & Steel Co. is operating this week at between 50 and 60 per cent. Wickwire Spencer is operating two open-hearths and Gould Coupler Works one open-hearth on part time. This is an average of 35 per cent in steel ingot production. No sizable bookings of fabricated structural or reinforcing bars are reported.

Old Material

Except for some small lots of No. 1 machinery cast, no scrap sales were made during the past week. The leading consumer in the district has now reduced its price on No. 1 heavy melting steel to $8.50 and its price on No. 2 heavy melting steel to $7. No transactions are reported, however, at these figures.

Chicago Steel Market Has Better Tone; Sales and Inquiries Increase

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CHICAGO, Nov. 2.—The Chicago iron and steel market is taking on a better tone as reflected by inquiries, sales and specifications. Inquiries, especially from automobile manufacturers, are more encouraging and both sales and specifications show sufficient increase to more securely intrench ingot output at the 25 per cent rate of recent weeks.

Improvement in world grain markets is one of the most stimulating events that the Middle West has experienced in a long time. As a result of this situation, steel producers visualize a better demand in rural communities, further improvement in farm implement manufacture and even higher earnings by railroads.

Estimators on building work are busier, but it is still characteristic of the market that individual inquiries are mostly for small tonnages. Inquiry from oil producing centers is dull. Restricted crude oil production foretells a slow tank market, and importation of foreign crude petroleum now looms as an added menace to the American industry.

The Chesapeake & Ohio has ordered 11,000 tons of track supplies, part of which will be furnished by Chicago mills. In other directions the rail and track supply market is dull, with nothing in sight that at all resembles a concerted buying movement. In fact, there are only two Western railroads that give promise of entering the market before the end of the year. Reports are rather insistent that the Santa Fe and the Chicago & North Western will inquire for cars. The North Western has in the past few months scrapped close to 11,000 cars, and has recently been able to negotiate a large loan.

The State of Illinois is awarding contracts for road work that will require 5000 tons of reinforcing bars and 12,000 tons of bridge steel, all to be delivered as early as possible next spring.

Western steel operations have not gained, but sales, specifications and inquiries increase.

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Rise in grain prices aids sentiment and points to better demands from rural communities.

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Railroad buying still lags, but two Western roads may enter market for cars.

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Pig iron shipments continue to gain.

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Pig Iron

The upward trend in shipments of Northern foundry iron is still in evidence, and new inquiries are somewhat more promising. Southern iron is steady at $11 a ton, Birmingham, and full differentials are being obtained. A local user is in the market for 200 tons. Lake Erie silvery producers are sending two cargoes to Chicago. This material will be stored on local docks for distribution as required after the close of navigation, which is only a few days off. Prices remain mixed, especially when all-rail and rail and water rates enter the competitive picture.

Coke

The local by-product foundry coke market is quiet. The price is steady at $7.50 a ton, local ovens. Use by foundries is slowly creeping up.

Fluorspar

Prices are somewhat variable, with $12.50 a ton, Kentucky mines, having been done on a few recent sales.

Bolts, Nuts and Rivets

October closed with a slight improvement over the preceding month, considering the industry as a whole. Much of this change can be attributed to automobile manufacturers.

Ferroalloys

The upward climb in shipments has been checked, but the rate is still well above the low point of August and September. Interest in new commitments is dull notwithstanding the approach of the contracting period.

Sheets

The sheet market still remains one in which new buying for future use is practically absent, and immediate needs are small. The few industries that were maintaining fair production schedules earlier in the fall are curtailing output slightly. Production by hot mills is not above 25 per cent of capacity.

Cold-Rolled Strips

Prices here are untested by tonnages, but small lots bring 2.15c. a lb., Cleveland, or 2.43c., delivered Chicago. Output remains close to 18 per cent, with interest in large commitments at a low level.

Hot-Rolled Strip

Production has been slowly gaining headway and now averages close to 30 per cent of capacity. Most of this gain has been recorded in the past two or three weeks.

Warehouse Business

Distribution from warehouses is showing little seasonal gain at a time when movement should be in substantial volume. The best week this fall was in late September and no week in October equaled this minor peak. October, which usually can be taken as an indicator of what is in store for the warehouses, has been drab. Prices are steady.

Cast Iron Pipe

About the only bright spot in the cast iron pipe market here is the promise that Fort Wayne, Ind., will open bids Nov. 3 on its needs for a new filter plant. A few small inquiries are out in Ohio, and Lansing, Mich., will take a small tonnage. The situation in Chicago is discouraging even to the point where the general contract on the Sanitary District tonnage is being disputed because it was awarded under the rate of wage law which has been declared invalid.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $42 to $44; 4-in., $45 to $47; Class A and gas pipe, $3 extra.

Wire Products

Demand for wire and wire products is again dropping, and production has been adjusted downward to about 25 per cent of capacity. However, producers see a hopeful sign in the rise of grain prices. Though jobbers have limited stocks on hand, they are finding the movement slow and their calls on producers are few. Here and there some gain is shown by the manufacturing trade, but the aggregate change is slight and is variable enough to obscure the general drift

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of this phase of the market. Demand for nails has eased, and use of fencing, both field and lawn, is showing further decline. Only a few pick-up orders for copper wire are coming from the utilities, which evidently have few, if any, expansion programs under way.

Rails and Track Supplies

This market remains unusually quiet both as to awards and inquiries. Rail and accessory order books are light, which is unusual for this time of year. Mills are operating at a variable and low rate.

Structural Material

Bridge work in Indiana, Michigan and Wisconsin accounts for the bulk of the tonnage in this market, which shows no signs of gaining headway. Outstanding among fresh inquiries is 1400 tons for work on the Mississippi River at Rock Island, Ill.

Plates

This commodity is about the slowest of the heavy tonnage finished steel products. Operations are on a low scale in local plate mills. Projects from oil fields are slow in developing. One welded pipe mill in this district is closed because of lack of orders.

Bars

A few additional releases have come from automobile manufacturers, and some sellers are hopeful that November will show still further improvement, though it is also stated that some new models will be held back until December to give the greatest possible impetus to the automobile shows. Agricultural implement manufacturers are distinctly encouraged because of recent advances in prices for grains and unfavorable crop reports from various grain producing countries. Indiana will open bids Nov. 24 on a $20,000,000 road building program. Rail steel bars, after giving promise, have turned quiet. Output ranges from 40 to 45 per cent of capacity.

Reinforcing Bars

The reinforcing bar market is about as dull as at any period in the memory of local dealers. For some time it has been apparent that large contracts were gradually disappearing from the market, but dealers saw rather hopeful signs in the fact that small inquiries and awards remained quite active. However, in the last week or 10 days there has been a noticeable drop in the number of small projects. As the situation now stands, there is no betterment in sight. Of special interest as to size is a grain elevator, requiring 2700 tons, at Albany, N. Y. James Stewart Corpn., Chicago, is general contractor. Prices for billet steel reinforcing bars have been strengthened at 1.50c. a lb., minimum out of Chicago warehouses, and here and there a dealer is making an effort to advance the market to 1.60c.

Old Material

Opinion in this market as to the immediate future is varied. Some foresee lower prices, while others expect that winter weather may restrict flow enough to add strength to the market. Several dealers report that unsolicited inquiries, which quite readily turn into orders, are on the increase, and it is certain that the movement of heavy melting steel to local mills is making further gains. On the other hand, one large consumer is said to be basing miscellaneous purchases of heavy melting steel at $8 a gross ton, delivered, but dealers are paying $7.75 and are not finding supplies any too plentiful. Acceptances of cast iron borings to be moved by boat to Lake Erie closed Nov. 2 and, with the local market extremely dull, a drop of 50c. a ton is expected. The Chicago & North Western and the Burlington are offering lists.

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St. Louis Stove Manufacturers Buy Some Pig Iron; Lack of Railroad Orders a Damper on Steel Trade

ST. LOUIS, Nov. 2.—Pig iron business during the week consisted mainly of orders of from 50 to 100 tons, and not many of these. The business came mostly from stove foundries, whose trade showed a considerable pick-up as a result of the long-needed buying stimulant of cold weather. There still is an almost absence of pig iron ordering and inquiry for extended delivery. Shipments of the local maker in October were fully equal to those of September. Prices are firm and unchanged.

Finished Steel

Demand for finished steel products continues at the low level of the last few months. There has been no pick-up in the buying of plates, shapes, bars or sheets. The price situation is unchanged, with the tone firm. Lack of buying by railroads has seriousiy affected the mills in this district, whose reliance chiefly is upon this business. So far the carriers have given no indication as to their requirements for 1932.

A leading fabricator of structural steel further curtailed operations during the week. It is estimated that such plants in the district are operating at about 20 per cent of capacity.

Old Material

The only large sale of the week was 600 tons of melting steel, which was in "distress," at 75c. a ton under the prevailing market price. The market continues dull. Dealers are only buying enough material to fill existing contracts, which are small. Prices are nominally unchanged. The Missouri Pacific Railway resubmitted its list of 60 carloads, reported last week as having been withdrawn, with a new list of 43 carloads, which were sold. The Pennsylvania list amounted to 19,355 tons, and others were: Baltimore & Ohio, 2985 tons; Cleveland, Cincinnati, Chicago & St. Louis, 20 carloads, and Nashville, Chattanooga & St. Louis, 8 carloads. The Louisville & Nashville states that it is selling its scrap rather than holding it for higher prices.

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Canadian Iron and Steel Industry Looks for Revival by New Year; Wages Cut at Dominion Plant at Sydney

TORONTO, Nov. 2.—While curtailment in operations continues in most branches of the Canadian iron and steel industry, executives are of the opinion that the new year will bring some change for the better. No large contracts for steel or allied products were placed during the week, and nothing of this nature is in sight at the moment.

According to an announcement by H. J. Kelley, general manager of the Dominion Steel & Coal Co., Sydney, N. S., wage and salary reductions, effective Nov. 1, will apply to all officials and employees of the company.

Pig Iron

Local blast furnace representatives state that they are receiving few inquiries for pig iron and all are for spot delivery. No interest is being shown by melters in other than immediate needs. Pig iron prices are unchanged.

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Structural Steel

Something of a revival in business developed in this market during the past week or 10 days. Although most sales were in small lots, a few orders exceeding 1000 tons each were booked, which, with previous orders, assure fabricators of operations at the present rate well into the new year. Several large contracts are pending for early closing.

Old Material

Business is almost at a standstill. Dealers are out of the market and have made no revision in prices.

Cleveland Steel Trade Sees Much Improved Sentiment

Further Increase in Tonnage from Automobile Industry Expected —Buying by Other Consumers Gains Slightly

CLEVELAND, Nov. 2.—November has started with better sentiment in the steel industry than for some time. Several factors combine to produce a more optimistic feeling, including steps that are being taken to improve the financial situation, a slight increase in orders for steel during the past week and expectations of an upturn in the automotive industry.

While there has been some gain in tonnage from the motor car industry, a further increase is expected from this source during the month. Parts makers in this territory secured some additional business from motor car manufacturers during the week. Reports from Detroit are to the effect that Chevrolet will produce 79,000 cars during November and December and that Ford will turn out 65,000 by the end of December and 70,000 in January.

Steel plant operations in Cleveland showed little change from the average of the past two months. The Otis Steel Co. this week resumed the operation of two open-hearth furnaces after a week's shutdown, but another producer took off a furnace, leaving in all 11 in operation or 32 per cent of ingot capacity. The American Steel & Wire Co. blew out a Donora furnace Saturday.

Aside from public work, no new inquiry is coming out in the construction field. Bids to be taken by the Ohio State Highway Department Nov. 6 cover numerous bridge projects, one requiring 350 tons of structural steel and the others taking small lots of shapes and reinforcing bars. Cleveland has opened bids for its underground exhibit hall. Other municipal projects, including a sewage disposal plant, requiring good tonnages are pending, but are slow in being closed. Local public work which has either been placed or on which bids have been taken will require 10,000 tons of reinforcing bars and 4500 tons of shapes.

Pig Iron

Sales in small lots gained slightly the past week, business having been stimulated to some extent by lower prices. A concession of 50c. a ton to $15.50, furnace, for foundry and malleable iron, which has been made by certain Lake furnaces for shipment to outside consuming markets, has been extended to include in some cases consumers in this territory. Some of the larger consumers are sounding out the market on prices for the first quarter. Shipments are starting out better this month than in October. A gain in shipping orders so far issued is largely from consumers outside of the automotive field. For Cleveland delivery, $17, furnace, for foundry and malleable iron is still being maintained and that price remains in effect in Indiana and southern Michigan.

Bars, Plates and Shapes

Demand for heavy rolled steel products shows a slight uptrend. Bars are moving a little better than recently to makers of automotive parts. While fabricators are inactive, a moderate amount of structural steel tonnage, largely in angles and other small sections, is coming from manufacturing plants. Small-lot orders for plates from miscellaneous consumers have become slightly more plentiful. The General Electric Co. will place welded tanks requiring 300 tons of plates. Prices are steady at 1.65c., Cleveland, for steel bars for local delivery and 1.60c., Pittsburgh, for plates and shapes.

Iron Ore

Shipments of Lake Superior ore were 3,094,424 tons in October. Total water shipments to Nov. 1 were 23,047,192 tons, a decrease of 48.34 per cent as compared with last year. Less than 400,000 tons of ore is scheduled for shipment this month. This year's movement will be the smallest, excepting 1921, in 27 years. The Pittsburgh Steamship Co. shipped its last cargo Saturday and other shippers are cleaning up rapidly.

Strip Steel

Demand for both hot and cold-rolled strip from the automotive industry has become slightly more active as plants making lamps and other motor car accessories are getting busier. Most of the orders are being taken at 1.55c., Pittsburgh, for wide strip and 1.65c. for narrow, the $1 a ton concession apparently being confined to round lot business. Orders for cold-rolled strip were confined to small lots, on which 2.15c., Cleveland, prevails.

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Track Supplies

The Chesapeake & Ohio Railroad has placed its orders aggregating over 11,000 tons of tie plates, track bolts and spikes. The tie plates, about 10,000 tons, were divided among the Wheeling Steel Corpn., Republic Steel Corpn., and Illinois and Inland steel companies.

Sheets

Several local stamping plants have taken orders for motor car parts, which resulted in a slight gain in sheet business during the past week. The local Fisher Body plant is starting to make bodies for the new model of Chevrolet cars and expects to be in fair production by Nov. 15. Round lot sheet purchases for this plant have not yet been made. Some good business in electrical sheets came out during the week. The metal furniture and stove industries remain quiet. Prices are firm.

Old Material

A Cleveland mill has purchased a small lot of No. 1 heavy melting steel, probably about 2000 tons, at around $8.25, delivered. This is for the best grade of heavy scrap. Dealers are offering $7.80 for material to fill this contract. Prices have again weakened under the very limited demand and the holding up of shipments by Cleveland and Valley mills, and producers and dealers who have material that they are anxious to move are letting it go at the best prices they can get. While recent quotations were nominal, it was expected that they would remain in effect in case there was a renewal of buying without extended delay. No. 1 heavy melting steel and several other steel-making grades and borings and turnings have declined 75c. a ton. Dealers in the Valley district are paying only $9.25 to $9.50 for No. 1 heavy melting steel.

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Detroit Scrap Market Still Very Dull

DETROIT, Nov. 2.—Dullness persists in the local scrap market. Little material is being sold by the automobile plants, due to extensive shutdowns, and, on the other hand, consumers are manifesting slight interest. Prices are unchanged.

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The fall meeting of the Electrochemical Society, New York section, will be held on Nov. 20, at 8.00 p. m., at Pratt Institute, Ryerson Street near Willoughby Avenue, Brooklyn. Non-members will be welcomed. Supper preceding the meeting will be served at 6.45 p. m. in the institute cafeteria at $1 per person. An opportunity will be given to inspect the chemical laboratories of the institute.

New York District Steel and Pig Iron Sales Not Gaining

Improvement in Sentiment Has Not Been Reflected in Demands —Structural Steel Award of 7500 Tons

NEW YORK, Nov. 2.—Demand for pig iron shows little variation from that in the previous week, new inquiry being largely for small lots. The only sizable tonnage pending is 1000 tons of foundry iron required for first quarter delivery for Harry C. Weiskittel Co., Inc., Baltimore. Total sales for the week at 4000 tons compare with 3500 tons each for the two preceding weeks.

Shipping releases against old contracts are more numerous. Foundry melt, however, is still at a low rate, and buyers are accepting more frequent deliveries presumably to anticipate their requirements after close of navigation.

With both Buffalo and eastern Pennsylvania base prices at practically the same level, competition is keen on all new business. Southern iron for Northern delivery is held firmly at $11 a ton, Birmingham.

Reinforcing Bars

Prices are firm at 1.60c., Pittsburgh, or 1.93c., delivered New York. A total of about 500 tons of bars is required for Pier 9, East River, and Pier 45, North River, for Department of Docks, New York. A sewage treatment plant in Yonkers, N. Y., will take about 215 tons, and roadwork on Route 36, Section 2, New Jersey, will require about 250 tons.

Cast Iron Pipe

New inquiries include 500 tons of 12-in. for Carlisle, Pa., and several hundred tons of various sizes for Meadville, Pa. City of New York let contract for 2000 tons of 20 and 24-in. to Knidem Construction Co., which is expected to purchase the pipe from Warren Foundry & Pipe Corpn. Boroughs of Queens and Brooklyn placed 1300 tons of 6 and 8-in., and Yonkers, N. Y., placed 200 tons of 18-in., both contracts going to United States Pipe & Foundry Co. City of New York awarded general contract for about 1700 tons of 30-in. to Bronx Water Works, but purchase of pipe will probably not be made until next week.

Prices per net ton delivered New York: Water pipe, 6-in. and larger, $32.90; 4-in. and 5-in., $35.90; 3-in., $42.90. Class A and gas pipe, $3 extra.

Finished Steel

Although local steel sales offices are receiving more encouraging reports from some of their principal customers in the East, the change in sentiment has not been reflected to any extent in steel orders. The volume of business, with rare exceptions, is just holding its own as compared with recent weeks. Price weakness, noted recently in strip steel, has not extended to other products, most of which are holding fairly well. No large tonnages have been placed except 7500 tons of structural steel for the New York Central section of the West Side elevated highway, which the McClintic-Marshall Corpn. will fabricate.

Old Material

The dealer making barge deliveries of No. 1 heavy melting steel to Buffalo has completed shipments for the season and is no longer buying to fill these contracts. While this interest has a contract for delivery of No. 1 heavy melting steel by barge to a Bridgeport, Conn., consumer, shipments probably will be made entirely from the company's stock in its yard in New Jersey. A small tonnage of heavy melting steel is moving to the Coatesville, Pa., mill at $8 a ton, delivered, and the blast furnace at Swedeland, Pa., is still accepting borings and turnings at $5.50 a ton, delivered. Other grades are inactive and prices unchanged.

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Pacific Coast Steel Tonnage Light, But Prospective Business Promises Slightly More Activity Soon

SAN FRANCISCO, Nov. 2.—October closed with extremely light awards on contracts and continued withholding of further specifications for stock requirements. As a result, pending tonnages and accumulated reserve demands continue to mount. There is, furthermore, an apparent increase of prospective tonnage in civic and Government projects. All factors indicate that November should be a slightly better month than October.

The Federal Government has issued a summary of the status of its building program, showing that plans are being prepared for 19 post offices in the Pacific Coast territory estimated to cost $9,500,000. Funds have been appropriated and plans will be prepared on 15 additional buildings to cost nearly $6,000,000. Bids are now being taken on Federal buildings at Portland, Ore., and Stockton and Berkeley, Cal., estimated to cost over $2,800,000. The total current Federal building program for the Far West is upwards of $18,000,000.

Cast Iron Pipe

Awards were 400 tons, with 250 tons in new inquiries. The American Cast Iron Pipe Co. took 200 tons for Glendora. Brea, Cal., has voted $20,000 bonds for a 6-in. line that will involve more than 100 tons.

Finished Steel

Finished steel awards of 650 tons are reported, with no new inquiries of note. The Dalles, Ore., has voted a $600,000 bond issue for a bridge across the Columbia River. A double leaf bascule type bridge estimated to cost $190,000 is proposed by Joint Highway District No. 12 at Knights Landing, Cal. The Idaho Highway Commission has called for bids Nov. 10 on a 161-ft. span over the Snake River north of St. Anthony.

About 1600 tons of plates will be required by Long Beach, Cal., for six reservoir tanks, on which bids will be received Nov. 10. Sacramento, Cal., will vote soon on a $10,800,000 bond issue for a mountain water supply system that will require 60 miles of 45 to 63-in. pipe.

Reinforcing bar awards totaled slightly more than 400 tons, with 2500 tons still open. Mill prices for bars range from 2c. to 2.10c., c.i.f. Pacific Coast ports. Warehouse prices are 2.50c., Los Angeles, and 2.60c., San Francisco, but are not strong.

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Cincinnati Pig Iron Sales in Small Lots

CINCINNATI, Nov. 2.—Except for an order from an Indiana melter for 250 tons of Northern foundry iron, transactions in pig iron in the past week, totaling about 1100 tons, were made up of less than 100-ton lots. Small inquiries are fairly numerous, but interest in substantial tonnages is lacking. Shipments against contracts are moving at a fair rate.

Finished Steel

The demand for sheets slackened last week. Orders are just above 30 per cent of capacity, making necessary a slight reduction in operations.

Old Material

Some improvement in shipments to distant points is noticeable, largely owing to bargain prices. Dealers' bids are unchanged.

Eastern Pennsylvania Orders for Sheets and Pipe Improve

Automobile Body Builders Place Small Sheet Orders and Inquiry for Foundation Pipe Continues

PHILADELPHIA, Nov. 2.—Minor improvement is noticeable in sheet buying, but other products continue quiet. Automobile body builders have placed small tonnages of sheets, and mills are receiving a substantial amount of inquiry for seconds from small manufacturers of sheet metal products. One mill, not in this district, which had a sizable accumulation of sheet seconds recently, has reduced its stock to less than 1000 tons. Prices are maintained except for occasional concessions of $1 a ton on plates and shapes.

Steel pipe for foundation and other underpinning work continues in fair demand. Foundations for the Philadelphia Post Office will require a good tonnage of steel pipe; the general contract has been awarded to McCloskey & Co., Philadelphia. About 2000 tons of pipe for a boulevard along the Schuylkill River has been awarded by the Frederick Snare Corpn., and Peter & A. J. Ellis, contractors on the approach to the University Avenue bridge have placed 500 tons of pipe with a Philadelphia jobber for direct shipment from a Pittsburgh mill. About 350 tons of copper-bearing, galvanized sheets for ventilating ducts in the new Pennsylvania station went to Fable & Co., Philadelphia, jobbers, for direct shipment from a West Virginia mill.

Rail inquiry from the larger railroads continues to lag, but the Louisville & Nashville has placed 22,000 tons with the Tennessee company, and the Chesapeake & Ohio has divided 1,300,000 tie plates.

Pig Iron

The steel company furnace at Swedeland, Pa., is scheduled to be blown out some time this month. Foundry iron is still irregular in price, with $15, furnace, quoted to consumers willing to place orders for tonnages ranging up to 500 tons, while $15.50 is usually quoted on carload lots for prompt shipment. In the past week, certain of the larger eastern Pennsylvania consumers of foundry iron have taken advantage of the present prices of foundry iron and have placed orders for a few hundred tons each for delivery over the rest of this year.

Steel Bars

Buying continues light, individual orders usually totaling well under a carload. Billet steel reinforcing bars at 1.60c., Pittsburgh, or 1.89c., Philadelphia, are still subject to $1 and $2 a ton concessions on desirable projects.

Plates and Shapes

Current buying is limited to lots of a carload of material. Fabricators of small tanks have some business and fabricating shops are bidding on a number of small projects including hospital buildings in Washington and a State legislative building at Dover, Del.

Sheets

Fabricators of small, underground storage tanks are buying heavy gage blue annealed sheets, and automobile body builders, who are beginning to increase operations, have placed small tonnages in the past week. Small producers of sheet metal products are showing increased interest in buying and have been active recently in purchasing second grades whenever they are available.

Imports

In the week ended Oct. 31, arrivals at this port consisted of 100 tons of ferromanganese and 58 tons of structural shapes from Germany, three tons of cold-rolled strip steel from England, 170 tons of steel bars, 146 tons of structural shapes, 20 tons of steel plates and 33 tons of steel bands from Belgium, five tons of structural shapes, 5 tons of steel bands and 40 tons of steel bars from France.

Old Material

With the furnace at Swedeland, Pa., scheduled to be blown out this month, the only available destinations for blast furnace scrap are Sparrows Point, Md., where the price is $4.50 a ton, and the Pittsburgh district. Based on these deliveries, dealers are only willing to offer about $2.50 a ton, f.o.b., equivalent to about $3.50 a ton, delivered to consumers' yards in this district

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Structural Steel Interlocking Floor

A ROLLED structural steel interlocking floor has been brought out by the Belmont Iron Works, Philadelphia, and a patent has been applied for. The floor is constructed from solid rolled structural steel shapes with fillets and sharp, true lines and edges. The interlocking flanges of the sections may be bolted, riveted or welded in the shop or in the field. Standard structural steel for bridges or buildings, in accordance with the specifications of the American Society for Testing Materials, is used. The floor is recommended for its great strength, which provides greater carrying capacity per square foot of floor surface, with a saving in total dead load per square foot of floor, which in skyscrapers is reflected in a further saving in the columns and foundations.

Besides being adapted for multiple-story construction, the Belmont floor is stated to be particularly suited for use for heavy-duty floors, such as in warehouses, loft buildings and in manufacturing plants and power houses where heavy machinery must be supported. Anchor bolts can be attached through the steel flooring, thereby distributing the vibrations through the entire floor to the columns and foundations.

Fireproofing for the floor fill and the suspended ceiling can be effected with materials possessing no structural qualities, such as gypsum and mastic. The troughs are convenient for placing conduits, pipes, ducts for wiring, wood sleepers, etc. Any type of finished flooring can be applied, such as terazza, tile, cork, linoleum.

Southern Steel Inquiry Gains; Alabama Pig Iron Still Dull

Moderate Amount of New Steel Tonnage in Prospect, But Pig Iron Buying Lacks Signs of Improvement

BIRMINGHAM, Nov. 2.—The slow movement of pig iron is unchanged. The melt has not improved to any appreciable extent, judging from current orders and shipments. Operations of pipe foundries, stove plants and jobbing foundries continue to take only a routine amount of iron. Shipments are still mostly in small lots, generally around a carload. Quotations stand at $12 for district tonnage. Operations this week are the same as last week with six furnaces in blast. The blowing out of two furnaces during October has brought current output closer to current melt.

Finished Steel

Inquiries continue to indicate a moderate amount of new tonnage in prospect. Bookings are slightly improved as compared with early October. An order for 2000 tons of plates was recently placed in the district according to an outside report but not confirmed here. Ingalls Iron Works has booked 1000 tons of structural steel for the addition of the Champion Fiber Co. at Canton, N. C. Aside from this order, current business of the fabricators of structural steel and reinforcing bars has been very small. Steel operations are unchanged from last week.

Cast Iron Pipe

Local plants are picking up small orders here and there, but the accumulation is not large, and plant schedules continue to depend mostly on weekly bookings. United States Pipe & Foundry Co. and National Cast Iron Pipe Co. are able to maintain a steady schedule, due to the large order from Lincoln, Neb., previously reported. Denver has placed 1400 tons with the American Cast Iron Pipe Co. Plant operations range from 30 to 35 per cent.

Old Material

The market is quiet, with only a minimum amount of buying by foundries. Quotations are the same as last week.

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Valley Mills Count Upon Automobile Releases to Aid Operations Which Have Gained Slightly

YOUNGSTOWN, Nov. 2.—While business in the Valleys has recovered to some extent from the immediate effects of bank failures in Youngstown, and sentiment in the steel industry is rather favorable, releases on finished steel products have not shown an appreciable gain. Ingot production last week registered a slight increase from the low level reached in the previous comparable period, and schedules this week indicate that capacity will be engaged at about 30 per cent of theoretical full. As this output is being taken with little or no movement to the pipe mills, it indicates a slight gain in general demand.

Increased releases from the automobile industry are expected daily, but have thus far been extremely light. Valley mills feel that the larger automobile makers must certainly release some tonnage for November shipment, and are counting on this to prevent a further decline in steel production. Auto body sheets have been moving a little better, but the common finishes continue very dull. Sheet mills in the Valleys are running no better than 25 per cent, and production of strip steel is even lower. Demand for bars has also failed to show any material gain. The tin mill at Warren operated last week at close to capacity, but has recently been fluctuating between 40 and 50 per cent.

Sheet consuming industries in the immediate Valley territory have been maintaining their requirements at a higher level than the average for the country as a whole. While no particular group could be considered above the general level, makers of steel building products, metal stampings, welding equipment and other lines have been doing fairly well. Fabricators of steel tanks are rather slack, and makers of railroad equipment are not any more active than they have been.

Prices are holding fairly well in a general way, although most Valley mills are revising their strip steel contracts downward in line with a $1 a ton reduction on hot-rolled material, and $2 on cold-rolled. Efforts are being made to maintain sheet prices, and shading has been infrequent to date. Bars and plates are also holding at 1.60c., Pittsburgh, and quotations on wire products are unusually well held. There is little to test the market on semi-finished steel; billets, slabs and sheet bars are still quoted at $29, Youngstown.

Raw material markets are weak, with pig iron somewhat weaker at $16, Valley furnace, for the foundry grade. Malleable and Bessemer iron have declined in sympathy. Basic quotations seem likely to be better held in the future, as an independent maker has liquidated its surplus stock of this grade and will no longer be a factor in the market. Scrap prices are holding following declines in recent weeks. No. 1 heavy melting steel is now quotable at about $10, Youngstown, and hydraulic compressed sheets at $9.75.

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New England Pig Iron Market is Firmer

BOSTON, Nov. 2.—Although pig iron prices are not actually higher, concessions by sellers have practically disappeared, which gives a firmer tone to the market. Sales, however, continue light, with little indication of improved business until buying for the first quarter starts. Sales for the week approximated 1200 tons, all in small lots, contracted with less than 1000 tons the previous week.

Fabricated Steel

McClintic-Marshall Corpn. was the low bidder for the State bridge at Erving-Gill, Mass., requiring 2400 tons of steel, but no award has been made. Otherwise the market is colorless, with no new business developing.

Cast Iron Pipe

The Warren Pipe Co. of Massachusetts, Inc., has been awarded 150 tons of centrifugal pipe by a public utility company and is low bidder on 600 tons of 30 and 42-in. pipe required by the Metropolitan Sewerage District, Boston. The 800 tons placed with the Warren Foundry & Pipe Corpn. for the Latham, N. Y., Water District will be made at Everett, Mass. That foundry has sufficient business on its books to keep its plant operating at capacity during the next two months.

Old Material

Business is still largely confined to scattered carlots of No. 1 heavy melting steel and bundled skeleton for Worcester, Mass., consumption; engine blocks, breakable cast, steel turnings, mixed borings and turnings for Pennsylvania delivery, and chemical borings for New Jersey consumption. Current prices are unattractive to scrap producers, consequently little material is coming on the market.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Copper and Tin Inactive —Lead Strong— Zinc Weak

NEW YORK, Nov. 2.

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	Nov. 2	Oct. 31	Oct. 30	Oct. 29	Oct. 28
Lake copper, New York	7.37½	7.37½	7.37½	7.37½	7.37½
Electrolytic copper, N. Y.*	6.75	6.75	6.75	6.75	6.75
Straits tin, spot, N. Y.	22.25	....	22.50	22.62½	22.87½
Zinc, East St. Louis	3.15	3.15	3.15	3.15	3.20
Zinc, New York	3.50	3.50	3.50	3.50	3.55
Lead, St. Louis	3.80	3.80	3.80	3.80	3.80
Lead, New York	4.00	4.00	4.00	4.00	4.00

*Refinery quotation; price ¼c. higher delivered in the Connecticut valley.
Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.50c. to 6.55c. a lb., New York.

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Copper

After a month of fair activity this market, which turned dull in the last week of October, is now absolutely colorless. As November starts, there is almost no demand here or from abroad. A holiday in France today and one here tomorrow partly explain the lack of buying. Sales for domestic account were quite good last month, made mostly by custom smelters. Contracts included some April delivery, all at 7c., delivered in the Connecticut Valley. Sales for shipment abroad were approximately 32,500 tons, against about 17,000 tons in September, all at 7.50c., c. i. f. usual European ports. Primary producers are active in the export market, but are doing very little in the domestic market at their price of 7.25c., delivered in the Connecticut Valley. Lake copper is quiet at 7.25c. to 7.37½c., delivered.

It is expected that October statistics will again reveal an increase in stocks of refined metal. No reliable information is available as to the deliberations of domestic and foreign producers on the problem of controlling output. Hearings in Washington on the question of a tariff on copper emphasized the conflicting views of American producers.

Copper Averages

The average price of Lake copper for October, based on daily quotations in THE IRON AGE, is 7.37½c., delivered New York. The average price of electrolytic copper is 6.75c., refinery, or 7c., delivered in the Connecticut Valley.

Tin

Consumers are covered so far ahead that there is practically no buying interest. Prices in this market are determined not by sales, but by fluctuations in the pound sterling. Based on these, quotations have been declining until spot Straits tin today is down to 22.25c., New York, as against 22.87½c. a week ago. London quotations are not far from those of a week ago at £127 7s. 6d. for spot standard, £129 12s. 6d. for future standard and £130 12s. 6d. for spot Straits, with the Singapore price at £133 5s.

Statistics for October show 5385 tons delivered to American consumers, which is larger than anticipated. The only estimate of the world's visible supply, available today, is that of A. Strauss & Co., London, which places the decline for October at 316 tons, bringing the total to 50,092 tons. The increase in the carryover in the East is 1316 tons. As this is not included in the visible supply, this means an apparent increase of 1000 tons. It is not known whether this tin is unsold or is held by the international syndicate. If held by the syndicate, the increase is not regarded as unfavorable. Straits output in October was 7266 tons, which is very high, and compares with an estimate of 6000 tons early in the month. For November the estimated output is 5000 tons.

Lead

This market is the one bright spot. October was very active, with total sales for shipment in that month in excess of 30,000 tons, which was beyond the expectations of the most optimistic. Sales for November consumption cover about two-thirds of estimated normal, with 40 per cent of December demand already taken. The feature of the market is the strong desire of consumers to buy ahead rather than on a hand-to-mouth basis. This buying movement is nearly as comprehensive as the one in June when the Hoover moratorium was announced. On Oct. 28 prices were advanced $5 a ton to 4c., New York, or 3.80c., St. Louis. Even at these higher levels, demand continues fairly brisk.

Zinc

In contrast to the strength of lead is the weakness of zinc. Sales were made on Oct. 30 as low as 3.15c., East St. Louis, which is five points below the previous low quotation for the year last spring. Demand is exceedingly light, with almost no galvanizing being done and with consumers fairly well covered for some time ahead.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	13.00c.
*Copper, hot rolled, base sizes, 1000 lb. and more	16.12½c.
Seamless Tubes—	
Brass	16.25c.
Copper	15.62½c.
Brass Rods	11.25c.
Brazed Brass Tubes	21.75c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Zinc sheets, open	10.25c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	25.00c. to 26.00c.
Tin, bar	27.00c. to 29.00c.
Copper, Lake	9.00c. to 10.00c.
Copper, electrolytic	8.50c. to 9.00c.
Copper, casting	8.25c. to 8.75c.
Zinc, slab	4.75c. to 5.25c.
Lead, American pig	4.75c. to 5.75c.
Lead, bar	6.50c. to 7.50c.
Antimony, Asiatic	9.00c. to 10.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	20.00c. to 23.00c.
Alum. ingots, No. 12 alloy	19.00c. to 21.00c.
Babbitt metal, commercial grade	19.00c. to 29.00c.
Solder, ½ and ½	16.50c. to 17.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	27.00c.
Tin, bar	29.00c.
Copper, Lake	8.37½c.
Copper, electrolytic	8.37½c.
Copper, castings	8.00c.
Zinc, slab	5.00c.
Lead, American pig	4.60c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	31.00c.
Solder, ½ and ½	19.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (All prices are nominal because of uncertain condition of market.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.25c.	6.00c.
Copper, hvy. and wire	5.00c.	5.75c.
Copper, light and bottoms	4.25c.	5.00c.
Brass, heavy	2.75c.	3.50c.
Brass, light	2.25c.	3.00c.
Hvy. machine composition	4.00c.	4.75c.
No. 1 yel. brass turnings	3.00c.	3.50c.
No. 1 red brass or compos. turnings	3.75c.	4.50c.
Lead, heavy	2.75c.	3.25c.
Zinc	1.25c.	1.75c.
Sheet aluminum	9.00c.	11.00c.
Cast aluminum	3.25c.	5.00c.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$29.00
Rerolling, 4-in. and under 10-in., Youngstown	29.00
Rerolling, 4-in. and under 10-in., Cleveland	29.00
Rerolling, 4-in. and under 10-in., Chicago	31.00
Forging quality, Pittsburgh	35.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron, dry, Spanish or Algerian	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Iron ore, basic and foundry, Russian, average 63% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 26c.
Manganese ore, African or Indian, 50 to 52%	23c. to 24c.
Manganese ore, Brazilian, 46 to 48%	22c. to 23c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $12.50

	Per Gross Ton
Chrome ore, 45% Cr_2O_3 crude, c.i.f. Atlantic seaboard	$20.00
Chrome ore, 48% Cr_2O_3, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.40
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.50
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	10.50
Foundry, by-product, Newark or Jersey City, delivered	8.70 to 9.10
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, 3-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.30 to .40
Gas slack, f.o.b. W. Pa. mines	.50 to .70

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	*$80.00 to $85.00
Foreign, 80%, Atlantic or gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$28.00 to $30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	31.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$25.00	13%	$29.00
11%	26.00	14%	31.00
12%	27.00	15%	33.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$20.00	11%	$23.00
7%	20.50	12%	24.00
8%	21.00	13%	26.00
9%	21.50	14%	28.00
10%	22.00	15%	30.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferromolybdenum, per lb. contained Mo., delivered	1.00
Calcium molybdate, per lb. contained Mo., delivered	85c.
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered: 2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$13.00
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.00

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$40.00	$32.00 to $35.00
Maryland	40.00	32.00 to 35.00
New Jersey	$44.00 to 59.00	.....
Ohio	40.00	32.00 to 35.00
Kentucky	40.00	32.00 to 35.00
Missouri	37.00	32.00 to 35.00
Illinois	40.00	32.00 to 35.00
Ground fire clay, per ton	6.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73 and 10
†Carriage bolts	73 and 10
Lag bolts	73 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	73 and 10
Hot-pressed nuts, blank or tapped, square	73 and 10
Hot-pressed nuts, blank or tapped, hexagons	73 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	73 and 10
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73 and 10
Semi-finished hexagons castellated nuts, S.A.E.	73 and 10
Stove bolts in packakes, P'gh.	80, 10, 10, 10 and 5
Stove bolts in packages, Ch'go.	80, 10, 10, 10 and 5
Stove bolts in pkgs., Cleveland	80, 10, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Ch'go.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland	80, 10, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 and 10 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	2.35

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. thread	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.89c.
Del'd New York	1.93c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.70c.
C.i.f. Pacific ports	2.00c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.50c. to 1.55c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c. to 1.35c.
F.o.b. Chicago Heights mill	1.50c. to 1.60c.
Del'd Philadelphia	1.49c. to 1.59c.

Iron

Common iron, f.o.b. Chicago	1.70c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.70c.
Del'd Cleveland	1.78½c.
Del'd Philadelphia	1.80½c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
F.o.b. Lackawanna	1.70c.
Del'd New York	1.88c.
C.i.f. Pacific ports	1.85c. to 1.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.70c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.78½c.
Del'd Philadelphia	1.71c. to 1.76c.
Del'd New York	1.85½c.
C.i.f. Pacific ports	2.05c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, Pittsburgh	1.60c. to 1.65c.
Wider than 6 in., P'gh	1.50c. to 1.55c.
6 in. and narrower, Chicago	1.75c.
Wider than 6 in., Chicago	1.65c.
Cooperage stock, P'gh	1.75c. to 1.85c.
Cooperage stock, Chicago	1.85c. to 1.95c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.05c. to 2.15c.
Strips, Cleveland	2.15c.
Strips, deliv'd Chicago	2.33c. to 2.43c.
Strips, Worcester	2.30c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.10c. to 3.20c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.90
Smooth coated nails	1.90
Galvanized nails	3.90

	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.35c.
Galvanized staples	2.60c.
Barbed wire, galvanized	2.55c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00

To Retail Trade

	Base per Keg
Standard wire nails	$2.00
Cement coated nails	2.00
Galvanized nails	4.00

	Base per Lb.
Smooth annealed wire	2.45c.
Smooth galvanized wire	2.90c.
Polished staples	2.45c.
Galvanized staples	2.70c.
Barbed wire, galvanized	2.65c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$60.00
Woven wire fence, 12½ gage and lighter, per net ton	65.00

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Sheets

Hot-Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.70c.
No. 10, f.o.b. Chicago mills	1.80c.
No. 10, del'd Philadelphia	1.99c.
No. 10, f.o.b. Birmingham	1.85c.
No. 10, c.i.f. Pacific Coast ports	2.33c.

Hot-Rolled and Annealed

No. 10, Pittsburgh	1.85c.
No. 10, Chicago mills	1.95c.
No. 10, Birmingham	2.00c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Chicago mills	2.50c.
No. 24, del'd Philadelphia	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, c.i.f. Pacific Coast ports	2.88c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.35c.
No. 10 gage, f.o.b. Chicago mills	2.45c.
No. 10 gage, del'd Philadelphia	2.64c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Chicago mills	3.05c.
No. 20 gage, del'd Philadelphia	3.24c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.10c.

Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh	2.75c.
No. 20, f.o.b. Pittsburgh	3.35c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.90c.
No. 24, f.o.b. Chicago mills	3.00c.
No. 24, del'd Philadelphia	3.19c.
No. 24, f.o.b. Birmingham	3.05c.
No. 24, c.i.f. Pacific Coast ports	3.38c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh	3.15c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.90c.
No. 20, f.o.b. Pittsburgh	3.40c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Chicago mills	2.75c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mills	$4.75
Standard cokes, f.o.b. Gary	4.85

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential per 100 Lb.
2000	(1½% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝-in. and larger	$2.70
Spikes, ½ in. and larger	2.70
Spikes, boat and barge	2.90
Tie plate, steel	1.85
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	*Iron* Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49½	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½%, and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		*Charcoal Iron*	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

Pig Iron Prices for All Districts

VALLEY

Per gross ton, f.o.b. Valley furnace:

Basic	$15.00
Bessemer	16.50
Gray forge	16.00
No. 2 foundry	16.00
No. 3 foundry	15.50
Malleable	16.50
Low phos., copper free	$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$15.50 to $16.00
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Bessemer	17.00

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	17.50
Malleable, not over 2.25 sil.	17.00
High phosphorus	17.00
Lake Super. charcoal, sil. 1.50	$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos., sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including an average switching charge of 61c. per gross ton.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., del'd St. Louis	19.16
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.16
Northern basic, deliv'd	19.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

*Buffalo No. 2, del'd east. N. J.	$17.78 to $18.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	16.89 to 17.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: $1.39 to $2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	25.28

NEW ENGLAND

Per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.91
*Buffalo, sil. 2.25 to 2.75	19.91
†Buffalo, sil. 1.75 to 2.25	19.28
†Buffalo, sil. 2.25 to 2.75	19.28
*Ala., sil. 1.75 to 2.25	$20.11 to 20.61
*Ala., sil. 2.25 to 2.75	20.61 to 21.11
†Ala., sil. 1.75 to 2.25	16.75
†Ala., sil. 2.25 to 2.75	17.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$14.69
Ala. fdy., sil. 2.25 to 2.75	15.19
Tenn. fdy., sil. 1.75 to 2.25	14.69
S'th'n Ohio silvery, 8 per cent	23.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$15.76 to $16.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	16.26 to 17.26
East. Pa. No. 1X	16.76 to 17.76
Basic (del'd east. Pa.)	16.76
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.04
Va. No. 2, 2.25 to 2.75 sil.	22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n fdy., sil. 1.75 to 2.25	$17.00
S'th'n fdy., sil. 1.75 to 2.25	17.01
Malleable	17.00
Ohio silvery, 8 per cent	24.00
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00
No. 1 fdy., 2.25 to 2.75 sil.	12.50
Basic	12.00

CANADA

Per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to 23.50

Old Material Quotations

PITTSBURGH

Per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$10.00 to	$10.25
No. 2 heavy melting steel	9.00 to	9.50
Scrap rails	10.00 to	10.50
Compressed sheet steel	9.50 to	10.00
Bundled sheets, sides and ends	9.00 to	9.50
Cast iron carwheels	10.50 to	11.00
Sheet bar crops, ordinary	11.00 to	11.50
Heavy breakable cast	8.00 to	8.50
No. 2 railroad wrought	10.00 to	10.50
Hvy. steel axle turnings	9.00 to	9.50
Machine shop turnings	7.00 to	7.50
Acid Open-Hearth Grades:		
Railr. knuckles and couplers	10.50 to	11.00
Railr. coil and leaf springs	10.50 to	11.00
Rolled steel wheels	10.50 to	11.00
Low phos. billet and bloom ends	13.00 to	13.50
Low phos. mill plates	11.50 to	12.00
Low phos. light grades	11.50 to	12.00
Low phos. sheet bar crops	12.50 to	13.00
Heavy steel axle turnings	9.00 to	9.50
Electric Furnace Grades:		
Low phos. punchings	12.50 to	13.00
Heavy steel axle turnings	9.00 to	9.50
Blast Furnace Grades:		
Short shoveling steel turnings	7.00 to	7.50
Short mixed borings and turnings	7.00 to	7.50
Cast iron borings	7.00 to	7.50
Rolling Mill Grades:		
Steel car axles	15.50 to	16.50
Cupola Grades:		
No. 1 cast	9.50 to	10.50
Rails 3 ft. and under	12.00 to	12.50

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton

Basic Open-Hearth Grades:		
Heavy melting steel	$7.75 to	$8.25
Shoveling steel	7.75 to	8.25
Frogs, switches and guards, cut apart, and misc. rails	7.75 to	8.25
Factory hyd. comp. sheets	6.00 to	6.50
Drop forge flashings	5.50 to	6.00
No. 1 busheling	5.50 to	6.00
Forg'd cast and r'l'd steel carwheels	8.25 to	9.25
Railroad tires, charg. box size	9.00 to	9.50
Railroad leaf springs cut apart	9.50 to	10.00
Axle turnings	6.00 to	6.50
Acid Open-Hearth Grades:		
Steel couplers and knuckles	8.50 to	9.00
Coil springs	9.50 to	10.00
Electric Furnace Grades:		
Axle turnings	6.00 to	6.50
Low phos. punchings	10.00 to	10.50
Low phos. plates, 12 in. and under	9.00 to	9.50
Blast Furnace Grades:		
Cast iron borings	4.00 to	4.50
Short shoveling turnings	4.00 to	4.50
Machine shop turnings	4.00 to	4.50
Rolling Mill Grades:		
Rerolling rails	10.00 to	10.50
Cupola Grades:		
Steel rails, less than 3 ft.	9.25 to	9.75
Steel rails, less than 2 ft.	10.00 to	10.50
Angle bars, steel	8.50 to	9.00
Cast iron carwheels	9.00 to	9.50
Malleable Grades:		
Railroad	7.00 to	7.50
Agricultural	7.00 to	7.50
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	19.00 to	21.00
*Relaying rails, 65 lb. and heavier	22.00 to	27.00

Per Net Ton

Rolling Mill Grades:		
Iron angle and splice bars	7.00 to	7.50
Iron arch bars and transoms	8.00 to	8.50
Iron car axles	13.50 to	14.50
Steel car axles	10.50 to	11.00
No. 1 railroad wrought	6.50 to	7.00
No. 2 railroad wrought	6.75 to	7.25
No. 1 busheling	5.00 to	5.50
No. 2 busheling	4.00 to	4.50
Locomotive tires, smooth	10.50 to	11.50
Pipes and flues	4.50 to	5.00
Cupola Grades:		
No. 1 machinery cast	8.50 to	9.00
No. 1 railroad cast	7.00 to	7.50
No. 1 agricultural cast	7.00 to	7.50
Stove plate	6.25 to	6.75
Grate bars	5.50 to	6.00
Brake shoes	5.75 to	6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$7.50 to	$8.50
No. 2 heavy melting steel		7.00
No. 1 railroad wrought	9.50 to	10.00
Bundled sheets (for steel works)		6.00
Hydraulic compressed, new	7.00 to	7.50
Hydraulic compressed, old	6.00 to	6.50
Machine shop turnings (for steel works)		5.50
Heavy axle turnings (or equiv.)	7.00 to	8.00
Cast borings (for steel works and roll. mill)	5.50 to	6.00
Heavy breakable cast (for steel works)		9.50
Railroad grate bars		7.50
Stove plate (for steel works)		7.50
No. 1 low phos., hvy. (0.04% and under)	11.00 to	12.00
Couplers and knuckles		11.00
Rolled steel wheels	10.00 to	10.50
No. 1 blast furnace		3.50
Wrot. iron and soft steel pipe and tubes (new specific.)		10.50
Shafting	15.00 to	15.50
Steel axles	15.00 to	15.50
No. 1 forge fire	7.50 to	8.00
Cast iron carwheels	11.50 to	12.00
No. 1 cast		10.50
Cast borings (for chem. plant)	11.50 to	12.00
Steel rails for rolling		10.50

CLEVELAND

Per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$7.25 to	$7.75
No. 2 heavy melting steel	7.00 to	7.50
Compressed sheet steel	7.00 to	7.25
Light bundled sheet stampings	6.00 to	6.50
Drop forge flashings	6.00 to	6.25
Machine-shop turnings	4.75 to	5.25
Short shoveling turnings	5.75 to	6.25
No. 1 busheling	6.50 to	6.75
Steel axle turnings	7.50 to	8.00
Acid Open-Hearth Grades:		
Low phos., billet bloom and slab crops	14.00 to	14.50
Elast Furnace Grades:		
Cast iron borings	5.75 to	6.25
Mixed borings and short turnings	5.75 to	6.25
No. 2 busheling	5.75 to	6.00
Cupola Grades:		
No. 1 cast	9.00 to	9.50
Railroad grate bars	6.00 to	6.50
Stove plate	6.00 to	6.50
Rails under 3 ft	15.00 to	15.50
Miscellaneous:		
Rails for rolling	13.00 to	13.50
Railroad malleable	11.00 to	11.25

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel		$9.00
No. 2 heavy melting scrap	$7.50 to	8.00
Scrap rails	9.50 to	10.00
Hydraul. comp. sheets		7.50
No. 2 hydraul. comp. sheets		5.50
Hand bundled sheets		7.00
Drop forge flashings		7.50
No. 1 busheling	7.50 to	8.00
Hvy. steel axle turnings	8.00 to	8.50
Machine shop turnings	4.50 to	5.00
No. 1 railroad wrought	7.50 to	8.00
Acid Open-Hearth Grades:		
Knuckles and couplers		10.00
Coil and leaf springs		10.00
Rolled steel wheels		10.00
Low phos. billet and bloom ends	12.50 to	13.00
Electric Furnace Grades:		
Short shov. steel turnings	7.00 to	7.50
Blast Furnace Grades:		
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling	4.50 to	5.00
Rolling Mill Grades:		
Steel car axles		12.00
Iron axles	16.00 to	16.50
Cupola Grades:		
No. 1 machinery cast	10.00 to	10.50
Stove plate	8.25 to	8.50
Locomotive grate bars	7.00 to	7.50
Steel rails, 3 ft. and under	12.00 to	12.50
Cast iron carwheels	10.50 to	11.00
Malleable Grades:		
Industrial	10.00 to	10.50
Railroad	10.00 to	10.50
Agricultural	10.00 to	10.50
Special Grades:		
Chemical borings	9.00 to	9.50

BIRMINGHAM

Per gross ton delivered Birmingham district consumers' yards:

Heavy melting steel	$8.50 to	$9.00
Scrap steel rails	8.50 to	9.00
Short shoveling turnings	4.00 to	5.00
Cast iron borings	(No market)	
Stove plate		6.00
Steel axles		14.00
Iron axles		14.00
No. 1 railroad wrought		6.50
Rails for rolling		10.00
No. 1 cast		9.00
Tramcar wheels	10.00 to	10.25
Cast iron borings, chem.		9.00

ST. LOUIS

Dealers' buying prices per gross ton:

Selected heavy melting steel	$7.50 to	$8.00
No. 1 heavy melting or shoveling steel	7.00 to	7.50
No. 2 heavy melting or shoveling steel	6.75 to	7.25
No. 1 locomotive tires	8.00 to	8.50
Misc. stand-sec. rails including frogs, switches and guards, cut apart	8.25 to	8.75
Railroad springs	8.75 to	9.25
Bundled sheets	4.25 to	4.75
No. 2 railroad wrought	7.00 to	7.50
No. 1 busheling	6.00 to	6.50
Cast iron borings and shoveling turnings	4.75 to	5.25
Iron rails	7.00 to	8.00
Rails for rolling	9.50 to	10.00
Machine shop turnings	3.00 to	3.50
Heavy turnings	5.50 to	6.00
Steel car axles	10.50 to	11.00
Iron car axles	14.00 to	14.50
Wrot. iron bars and trans.	5.50 to	6.00
No. 1 railroad wrought	5.00 to	5.50
Steel rails, less than 3 ft.	10.00 to	10.50
Steel angle bars	7.00 to	7.50
Cast iron carwheels	6.50 to	7.00
No. 1 machinery cast	8.00 to	8.50
Railroad malleable	5.50 to	6.00
No. 1 railroad cast	6.25 to	6.75
Stove plate	6.50 to	7.00
Relay. rails, 60 lb. and under	16.00 to	16.50
Relay. rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	5.00 to	5.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel		$4.50
Heavy melting steel (yard)	$2.75 to	3.00
No. 1 hvy. breakable cast	5.50 to	6.00
Stove plate (steel works)		3.50
Locomotive grate bars		3.50
Machine shop turnings		2.00
Short shoveling turnings		2.00
Cast borings (blast fur. or steel works)		2.50
Mixed borings and turnings		2.00
Steel car axles	11.00 to	11.50
Iron car axles (nom.)	14.00 to	14.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)		5.50
Forge fire	3.25 to	3.75
No. 1 railroad wrought	5.25 to	5.75
No. 1 yard wrought, long	4.25 to	4.75
Rails for rolling	6.25 to	6.50
Stove plate (foundry)	4.75 to	5.50
Malleable cast (railroad)	6.00 to	6.50
Cast borings (chemical)	8.00 to	8.50
Per gross ton, delivered local foundries:		
No. 1 machinery cast		$8.50
No. 1 hvy. cast (columns, bldg. materials, etc.; cupola size)		6.50
No. 2 cast (radiators, cast boilers, etc.)		5.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$3.80 to	$4.60
Scrap T rails	4.10 to	4.60
Scrap girder rails	3.10 to	3.60
No. 1 railroad wrought	4.50 to	5.00
Machine shop turnings	1.25 to	2.10
Cast iron borings (steel works and rolling mill)	1.50 to	1.75
Bundled skeleton, long	3.00 to	3.25
Forge flashings	3.00 to	3.50
Blast furnace borings and turnings	1.25 to	1.30
Forged scrap	2.00 to	2.50
Shafting	10.00 to	10.50
Steel car axles	11.00 to	12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	4.00 to	4.25
Rails for rolling	8.50 to	9.00
Cast iron borings, chemical	7.00 to	7.25
No. 2 cast	4.85 to	5.00
Per gross ton delivered consumers' yards:		
Textile cast	$9.50 to	$10.00
No. 1 machinery cast	9.50 to	10.00
Stove plate	5.00 to	5.25
Railroad malleable	10.50 to	11.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$6.75 to	$7.25
Scrap rails for melting	8.50 to	9.00
Loose sheet clippings	3.50 to	4.00
Bundled sheets	5.50 to	6.00
Cast iron borings	3.25 to	3.75
Machine shop turnings	4.00 to	4.50
No. 1 busheling	5.00 to	5.50
No. 2 busheling	3.25 to	3.75
Rails for rolling	9.00 to	9.50
No. 1 locomotive tires	8.50 to	9.00
No. 2 railroad wrought	6.75 to	7.25
Short rails	11.75 to	12.25
Cast iron carwheels	8.25 to	8.75
No. 1 machinery cast	10.00 to	10.50
No. 1 railroad cast	8.75 to	9.25
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Brake shoes	4.25 to	4.75
Agricultural malleable	8.00 to	8.50
Railroad malleable	9.00 to	9.50

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting and shov. steel	$6.00 to	$6.50
Borings and short turnings	4.50 to	5.00
Long turnings	4.00 to	4.50
No. 1 machinery cast	8.50 to	9.00
Automotive cast	11.00 to	11.50
Hydraul. comp. sheets	5.75 to	6.25
Stove plate	5.00 to	5.50
New No. 1 busheling	5.00 to	5.50
Old No. 2 busheling	3.25 to	3.75
Sheet clippings	3.50 to	4.00
Flashings	5.25 to	5.75

CANADA

Dealers buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	....	10.00
Stove plate	....	8.00
Standard carwheels	....	8.50
Malleable	....	8.00
Per Net Ton		
No. 1 machinery cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

Warehouse Prices for Iron and Steel Products

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.50c. to 1.80c.
Rail steel reinforcement—	
For buildings	1.25c. to 1.50c.
Highway slabs	1.40c.
For bridges and culverts	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.10c.
Flats and squares	3.60c.
Bands, $\frac{7}{8}$ in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes ($\frac{7}{8}$ in. and larger)	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Coach and lag screws	73
Hot-pressed nuts, sq., tap. or blank	73
Hot-pressed nuts, hex., tap. or blank	73
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex	3.10c.
Cold-fin. flats and sq	3.60c.
Hoops and bands, No. 12 to $\frac{7}{8}$ in., inclusive	3.00c.
Hoops and bands, No. 13 and lighter	3.55c.
Cold-finished strip	*5.55c.
Hot-rolled annealed sheets (No. 24)	3.60c.
Galvanized sheets (No. 24)	4.00c.
Hot-rolled sheets (No. 10)	3.00c.
No. 9 ann'l'd wire, per 100 lb	$2.25
No. 9 galv. wire, per 100 lb	2.70
Com. wire nails, base per keg	2.25

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs	2.65
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25

	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq	3.65c.
Rounds and hex	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

NEW YORK

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.60c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, $\frac{1}{2}$ x $\frac{1}{4}$ in. and larger	3.40c.
Smooth finish, 1 to 2$\frac{1}{2}$ x $\frac{1}{4}$ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
$\frac{3}{4}$ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
$\frac{1}{2}$ x 6 in. and smaller	65 to 65 and 10
$\frac{3}{4}$ x 20 in. and smaller	65 to 65 and 10

Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.00c.
Boiler rivets	4.00c.

	Per Cent Off List
Tank rivets, $\frac{7}{8}$-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	73
Carriage bolts	73
Lag screws	73
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	73
Less than 200 lb.	63
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	73
Less than 200 lb.	63

PACIFIC COAST

(Less than 5000 Lb.)

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates and struc. shapes, $\frac{1}{4}$-in. and heavier	2.80c.	3.00c.	2.25c.
Soft steel bars	2.80c.	3.00c.	2.25c.
Reinforcing bars	2.80c.	2.80c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.90c.	4.00c.	3.50c.
Hot-rolled sheets (No. 10)	3.40c.	3.50c.	3.00c.
Galv. sheets (No. 24)	4.40c.	4.20c.	4.00c.
Struc. rivets, $\frac{1}{2}$ in. and larger, less than 1000 lb.	5.00c.	5.00c.	5.50c.
Special nails; common 4 to 60d; smooth box 4 to 20d; finish 6 and 8 d; base per keg	$2.55	$2.45	$2.40
Other wire nails, base per keg	2.80	2.70	2.65
Cement c't'd nails, 100-lb. keg	2.65	2.70	2.65

PITTSBURGH

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.10c.
Squares and flats	3.60c.
Bands	2.95c.
Hoops	3.60c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.05c.
Galv. sheets (No. 24), 25 or more bundles	3.65c.
Hot-rolled sheets (No. 10)	3.15c. to 3.20c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.74c.
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count,	73 and 10 per cent off list
Machine bolts, 100 count,	73 and 10 per cent off list
Carriage bolts, 100 count,	73 and 10 per cent off list
Nuts, all styles, 100 count,	73 and 10 per cent off list
Large rivets, base per 100 lb.	$3.00
Wire, black, soft ann'l'd, base per 100 lb.	2.30
Wire, galv. soft, base per 100 lb.	2.75
Common wire nails, per keg	$2.05 to 2.15
Cement coated nails, per keg	2.05 to 2.15

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

PHILADELPHIA

	Base per Lb.
Plates, $\frac{1}{4}$-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to $\frac{7}{8}$-in., inclu.	2.90c.
Spring steel	5.00c.
Hot-rolled box annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	4.00c.
Hot rolled blue annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, $\frac{1}{4}$-in.	5.20c.
Swedish iron bars	6.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

BOSTON

	Base per Lb.
Plates	*3.35c.
Structural shapes—	
Angles and beams	*3.35c.
Tees	*3.35c.
Zees	*3.35c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.

	Per Cent Off List
Machine bolts	65 and 5
Carriage bolts	65 and 5
Lag screws	65 and 5
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

Fabricated Structural Steel

AWARDS of fabricated structural steel are 20,000 tons, compared with only 9000 tons a week ago and 15,000 tons two weeks ago. New projects of 5500 tons, compare with about 9500 tons a week ago, and are the smallest recorded total for a week. Awards follow:

NORTH ATLANTIC STATES

Hartford, Conn., 100 tons, building and tanks for Hartford Electric Light Co., to Chicago Bridge & Iron Works Co.

Willimantic, Conn., 300 tons, hospital, to Bethlehem Fabricators, Inc.

Bangor, Me., 140 tons, armory, to Lyons Iron Works.

New York Central Railroad, 7500 tons, viaduct, West Eighteenth to Thirtieth Street, New York, to McClintic-Marshall Corpn.

Staten Island, N. Y., 500 tons, farm colony buildings, to B. Schaeht & Sons.

Mitchel Field, L. I., 120 tons, additional structural steel for 18 buildings, to Belmont Iron Works.

Washington, 800 tons, addition to Senate Office Building, to American Bridge Co.

Ridgefield, N. J., 200 tons, Erie Railroad bridge, to McClintic-Marshall Corpn.

Philadelphia, 110 tons, building for Ellis College, to McClintic-Marshall Corpn.

Huntington, Pa., 250 tons, two bridges, to an unnamed fabricator.

State of New Jersey, 277 tons, viaduct at Hillside, to McClintic-Marshall Corpn.

THE SOUTH

State of Virginia, 170 tons, road bridges in Alleghany County, to Roanoke Iron & Bridge Co.

Canton, N. C., 1000 tons, Champion Fiber Co. addition, to Ingalls Iron Works.

Victoria, Tex., 157 tons, highway bridge, to Virginia Bridge & Iron Works.

Memphis, Tenn., 520 tons, waterworks pumping station, to Pidgeon-Thomas Iron Co.

Murray, Ky., 100 tons, post office, to Pidgeon-Thomas Iron Co.

CENTRAL STATES

Aurora, Ill., 300 tons, Chicago, Burlington & Quincy Railroad paint shop, to Joseph T. Ryerson & Son, Inc.

Bedford, Mo., 110 tons, bridge for Wabash Railway Co., to Mississippi Valley Structural Steel Co.

Wausau, Wis., 650 tons, Bridge Street bridge, to Milwaukee Bridge Co.

Manitowoc, Wis., 150 tons, vocational school, to Milwaukee Bridge Co.

WESTERN STATES

Seattle, 100 tons, stand pipe, to Western Engineering Co.

CANADA

Winnipeg, Man., 2000 tons, bridge at Salter Street, to Dominion Bridge Co.

Sherbrooke, Que., 1500 tons, cellophane plant for Canadian Industries, Ltd., to Dominion Bridge Co.

HAWAIIAN ISLANDS

Hawaii, 1500 tons, Lualualei and West Loch building, to Belmont Iron Works.

FRANCE

Paris, 1400 tons, American Embassy building, to Société Métallurgique d'Enghein, Saint-Eloi, Enghein, Belgium.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

NORTH ATLANTIC STATES

Yonkers, N. Y., 800 tons, senior high school.

Dover, Del., 250 tons, State legislative building.

THE SOUTH

Baton Rouge, La., 1371 tons, highway bridges; Fangephon Parish, 550 tons; Washington Parish, 600 tons; Rapides Parish, 221 tons.

Knippa, Tex., 360 tons, highway bridge.

Corpus Christi, Tex., 2000 tons, steel piling, for a dam.

CENTRAL STATES

State of Ohio, 350 tons, highway bridge in Delaware County.

Cleveland, 2360 tons, exhibition hall; Samuel W. Emerson Co., Cleveland, low bidder.

Chicago, 700 tons, steam heating plant for Chicago Union Station.

Rock Island, Ill., 1400 tons, dam across Mississippi River.

Franklin County, Ind., 500 tons, highway bridge.

State of Michigan, 900 tons, highway bridges.

State of Indiana, tonnage not given, highway bridges included in a $20,000,000 program.

WESTERN STATES

Sheldon, Wash., 250 tons, highway bridge.

FABRICATED PLATE

PROJECTS PENDING

Long Beach, Cal., 1650 tons, six reservoir tanks for Alamitos Hill water project.

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Railroad Equipment

Northern Pacific is inquiring for 150 hopper cars.

Aluminum Ore Co., East St. Louis, Ill., subsidiary of Aluminum Co. of America, has purchased 10 all-aluminum 70-ton hopper cars from Canton Car Co.

United States Navy, Bureau of Supplies and Accounts, has ordered three flat cars from Haffner-Thrall Car Co., Chicago.

Missouri-Kansas-Texas, recently reported as having ordered two gas-electric rail motor cars from St. Louis Car Co., will equip one of these cars with a Brill model 660 power plant, and Westinghouse electrical equipment.

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Reinforcing Steel

Awards and Pending Projects in Light Volume

THE past week has been one of the dullest in several months. Lettings amounted to 1500 tons, the same total as those in the previous week. New inquiries at 2600 tons compare with 12,745 tons a week ago. Contracts for October called for 27,100 tons, the heaviest for any month since April. September bookings were 17,175 tons and those in August 11,200 tons. Awards follow:

Washington, 900 tons, foundation for Post Office Department building, to Concrete Steel Co.

Washington, 400 tons, foundations for Interstate Commerce Commission and Department of Labor buildings, to Concrete Steel Co.

Chicago, 200 tons, bakery for Great Atlantic & Pacific Tea Co., to Inland Steel Co.

REINFORCING BARS PENDING

Inquiries for reinforcing steel bars include the following:

Yonkers, N. Y., 215 tons, sewage treatment plant; bids to be opened Nov. 6.

Yonkers, N. Y., 225 tons, high school; William A. Berbusse, low bidder for general contract.

New York, 520 tons, Piers 88, 90 and 92, North River, for Department of Docks; Allen N. Spooner & Son, Inc., low bidder for general contract.

New York, 519 tons; 358 tons for Pier 9, East River, and 161 tons, Pier 45, North River, for Department of Docks.

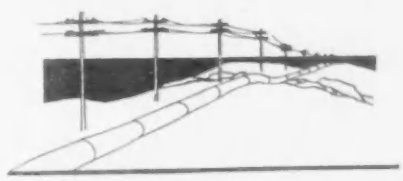
State of New Jersey, 250 tons, road work, route 36, section 2; bids to be opened Nov. 15.

Albany, N. Y., 2700 tons, grain elevator; James Stewart, Chicago, general contractor.

Fort Wayne, Ind., 1300 tons, filter plant.

Little Rock, Ark., 150 tons, hospital, William Peterson, Little Rock, general contractor.

El Reno, Okla., 325 tons, State reformatory.



PIPE LINES

Kansas Communities Gas Co., Chanute, Kan., plans construction of natural gas pipe line, about 12 miles, with compressor station, estimated to cost $100,000. W. E. Murphy is treasurer and general manager.

Texas Pipe Line Co., San Antonio, Tex., is planning construction of 8-in. pipe line from Daxton to Barbers Hill, Chambers County, about 12 miles, to cost over $75,000. Company is subsidiary of Texas Co., Houston, Tex.

Board of Public Works, San Francisco, is planning early call for bids for construction of coast range emergency pipe line in connection with Hetch Hetchy water system, requiring about 24 miles of steel pipe line, estimated to cost $1,730,000. S. J. Hester is secretary.

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Announces New Hard Alloy for Cutting Steel

A new hard alloy, a cemented carbide, the composition of which has not as yet been made public, is being placed on the market by Thomas Prosser & Son, 15 Gold Street, New York. It is intended for use on all commercial steels and is offered especially for work requiring light cuts at high speeds.

This alloy was developed by Fried, Krupp, A.G., Essen, Germany, at the request of the Prosser company, to meet American conditions. It is emphasized that the new material is intended to supplement tungsten-carbide, giving the same or better results on steel than the tungsten-carbide does on cast-iron, non-ferrous and the other materials for which it has proved an advantage.

An important feature is that tips tested to destruction show that the material splits or breaks off in layers, rather than shattering. The process of manufacture, application to lathe-type tools and milling cutters, tool angles and grinding are the same as with Widia cemented tungsten-carbide. The material is also supplied in the same forms and is the same in price as Widia.

Fabricators Indorse Plan to Stabilize Their Industry

(*Concluded from page* 1190)

count the local associations already in existence as far as is possible.

"A director of trade relations of local associations might be appointed. This director of trade relations shall work under the direction of the American Institute of Steel Construction.

"The total rated capacity in tons of each district should be ascertained by adding the individual capacities of all the shops in the district; the rated capacity, in tons, of each shop to be determined according to a definite plan.

"At the end of each month each local association should advise the director of trade relations as to the amount of tonnage booked for fabrication in that district for the coming months, the rated capacity of the district in tons, divided by the tonnage booked for fabrication for the month, to be known as the district operating percentage for that month.

"Upon receipt of this information the director of trade relations should determine the percentage at which the entire industry of the country is operating and issue a bulletin as soon after the first of the month as is possible to every member of the industry, such bulletin to show the operation percentage at which the entire country—each local district—and perhaps each individual shop—will operate for the coming months.

"It is believed that the effect of these reports would be to discourage distant fabricators from attempting to secure business in a district where the reported operating percentage is below the average for the industry, thereby tending to stabilize employment and tending to promote the best interest of the public.

"The organization of local associations and the method of functioning are matters to which much thought and consideration must be given. It is particularly hoped that it will be found possible to devise rules and methods whereby in every case a fabricator will not attempt to operate in a distant district without first notifying the local association operating in that district of his intentions.

Trade Rules Should Govern Whole Industry

"The rules of the local associations should be so coordinated that they shall become the standard rules of the industry, to the end that those outside of the associations shall also be governed by them.

"In order that a local association may be of service to the industry and establish better conditions, it must have a definite plan of cooperation with well formulated rules of practice and procedure with suitable and positive provisions for their enforcement.

"In the development of this plan it is contemplated that competent legal counsel be employed to give every positive assurance that no action may be taken in any respect in conflict with existing laws.

"The principle on which this plan is based is that every member of the institute is entitled to his proper share of the business available. In other words, if the total business contracted over the country, at the end of the year, is only 60 per cent of the total rated capacity of the country, then a shop having a rated capacity of 10,000 tons a year would have been entitled to have contracted and fabricated 6000 tons during that year. If it had contracted and fabricated in excess of this tonnage, then the dues which it pays to the institute for the development of the industry should properly be increased.

"Each member shall continue to pay dues to the institute in accordance with the established schedule per ton."

Necessity for Deposits

Mr. Conley told the convention of some of the objections that had been raised to the plan and the answers that had been prepared by the plan committee. One objection, he said, was to the 25c. a ton deposit. The answer was:

"With the total lack of mutual confidence among fabricators, it is an absolute guarantee of good faith. Without it the plan would fail as all other plans have failed."

Another criticism was that the plan puts a premium on inefficiency by guaranteeing an inefficient fabricator his full share of business regardless of whether he scratches for it or not. The answer was:

"If a fabricator is inefficient, other fabricators can put in an allowance for penalties and still beat him."

It was pointed out that in the course of time the inefficient fabricator's percentage will become zero and he will be out of business, which is what competition would do anyway.

No Restrictions on Growth

It was charged that the plan would prevent a fabricator from growing except as the entire industry grows. Mr. Conley denied this contention, saying:

"A fabricator can grow by taking more than his allowable percentage of work. He pays a penalty but his allowable percentage automatically increases for the succeeding year. If his growth is due to legitimate causes, such as better management, a favorable change in freight rates, or a rapidly developing territory, the price he pays for his increased allowable percentage is not too high."

The suggestion was made that a fabricator could increase his allowable percentage by cutting prices. The answer was:

"He could, but at what a price. If he cuts prices to take more than his share of the business, he loses to his customer and on top of that has to pay a penalty to the association. Then, when he gets his increased percentage, the only way he can hold it is to continue to quote cut prices. His situation is different from that outlined in the last objection. In that case the fabricator received his increased percentage because of natural developments in his favor. The advantages that enabled him to win it will continue to be with him and he will be able to hold his increased percentage without continued loss."

Effect on Prices

It was objected that the plan gives not positive assurance that prices will be improved. "The plan is not supposed to give such assurance," said Mr. Conley. "Agreements to raise or fix prices are illegal. The object of the plan is to assure a fabricator who is below his allowable percentage that he need not cut prices to get even, because his competitors who are above their percentages will raise their prices, thus giving him a better chance to take work until such time as he catches up."

The criticism was made that, if the plan does result in raising the price level, brokers, foundries or machine shops will invade the fabricating field. This point was answered as follows, "That is the same thing as saying, 'Let's not improve our business for fear of making it attractive to others and bringing in more competition.'"

Election of Officers

Charles N. Fitts, New England Structural Co., Boston, was reelected president of the institute, and Clyde MacCornack, Phoenix Bridge Co., Phoenixville, Pa., was elected first vice-president. C. G. Conley, Mount Vernon Bridge Co., Mount Vernon, Ohio, was made second vice-president, and T. J. Foster, National Bridge Works, New York, was named treasurer to succeed E. J. Pistor. Robert T. Brooks, George A. Just Co., was elected assistant treasurer.

Members of the board of directors were reelected, and three new directors were added as follows: Robert T. Brooks, E. K. Klingelhofer, Pittsburgh Bridge & Iron Works, Pittsburgh; and A. J. Post, Post & McCord, New York.

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Fabricated Plate Orders Higher in September

WASHINGTON, Nov. 2.—Orders for fabricated steel plate in September rose to 33,473 tons from 24,282 tons in August, according to reports made to the Bureau of the Census by 51 manufacturers. The September bookings in net tons were distributed as follows: Oil storage tanks, 4024; refinery materials and equipment, 1438; tank cars, 102; gas holders, 8963; blast furnaces, 254; miscellaneous, 18,692. Orders in the first nine months of 1931 totaled 246,473 tons against 379,300 tons in the corresponding period of last year.

British Industry Is Gaining Confidence as Demands Grow

Pig Iron Stocks Being Worked Off and Furnaces May Start Up—Steel Works Booking Orders More Freely

LONDON, ENGLAND, Nov. 2. (By Cable). British industry is gaining confidence and looks for steady growth in demand in the near future. Domestic demand for pig iron is increasing, stocks are being worked off, and some furnaces are arranging to start up again. British steel works are booking orders more freely. Shipbuilding work is increasing. The Government's intentions on the tariff are still uncertain.

United Kingdom demand for Continental iron and steel is quieter after recent purchasing, but there is a slightly improved call from overseas markets. Many works are now quoting in sterling for shipment from United Kingdom, but prices fluctuate on the exchange.

Tin plate demand is slow to revive, apparently awaiting signs of stability in prices. Works anxious to maintain output are accepting down to 13s. 9d., f.o.b. works; others ask up to 14s. 3d. Galvanized sheets have been booked for the Far East but in insufficient amounts to improve mills' position materially; consequently prices are easier.

The Continental Raw Steel Cartel has decided to renew existing arrangements until the end of the year. The Continental Wire Rod Cartel has been renewed for five years, with members free to quote in any currency. At the next meeting this month the output program for the first quarter will be discussed. The International Tube Syndicate adheres to the gold basis for quotations, with the exception of certain exclusive British export markets.

The Belgian position is slightly improved on better buying from India and China. The French position is growing worse, and some home prices have been reduced. The German depression is acute, with plants accepting orders below cost to insure even partial working. German export rebates for November are unchanged. German railways have ordered 92 locomotives from German builders.

Russia is endeavoring to buy British locomotives and railway material on 12 months' credit. Russian iron and steel imports from January to June, inclusive, were 614,000 tons.

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Depreciated Currency Converted Into Products

HAMBURG, GERMANY, Oct. 21.—Reports are being received by Hamburg exporters that demand for manufactured products is rapidly increasing in countries which have departed from the gold basis. This movement to exchange unstable money for goods is stated to be rapidly exhausting stocks in those countries, and replenishment by wholesale distributers is expected soon. In fact, it is suggested that buying by countries with depreciated currency would have increased before had it not been for the confusion in international exchange and difficulty in obtaining financing. Much of the buying is reported to be in iron, steel, hardware and machinery, as well as non-ferrous metals.

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Rumania Trades Pig Iron for Railroad Material

HAMBURG, GERMANY, Oct. 21.—Large scale trade by barter continues a factor in European business. A recent transaction was between Italian steel mills and locomotive builders and the Rumanian Uzilene de Fer works at Hunedoara, producer of spiegeleisen and charcoal pig iron. Under the contract, pig iron will be shipped to Italy for the next two years and payment to the extent of about $400,000 will be accepted in railroad material and locomotives for the Rumanian railroads.

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Tata Works Increases Control by Natives

JAMSHEDPUR, India, Oct. 1.—Despite general business depression, the Tata Iron & Steel Co., Ltd., is adhering to its policy of maintaining the wages of the lower paid men in the company and is hastening control by Indians. In recent months 24 covenanted men have been replaced by natives, says J. L. Keenan, general manager. Prem Mathur, an Indian, who has been assistant superintendent of the duplexing plant for the past four years and who was a metallurgist for a number of years at the Ford plant in Detroit, has been appointed superintendent of the open-hearth department. Henceforth, six of the seven open-hearth furnaces will be operated entirely by Indians.

British and Continental European Export Prices f.o.b. United Kingdom Ports, Hamburg and Antwerp

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton, £ at $3.96

Ferromanganese, export	£9	0s.				$37.64		
Billets, open-hearth	5	5	to	£5	12½s.	20.79	to	$22.19
Black sheets, Japanese specifications	9	15	to	10	0	38.61	to	39.60
Tin plate, per base box (nom.)	0	13½	to	0	14½	2.67	to	2.87
						Cents a Lb.		
Steel bars, open-hearth	7	17½	to	8	7½	1.39	to	1.48
Beams, open-hearth	7	7½	to	7	17½	1.30	to	1.39
Channels, open-hearth	7	12½	to	8	2½	1.34	to	1.43
Angles, open-hearth	7	7½	to	7	17½	1.30	to	1.39
Black sheets, No. 24 gage	8	5	to	8	10	1.46	to	1.50
Galvanized sheets, No. 24 gage	9	10				1.67		

Continental Prices, f.o.b. Antwerp or Hamburg

Per Metric Ton, Franc at 3.95c.

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	286 fr.	to	289 fr.	$11.30	to $11.42
Billets, Thomas	344 fr.	to	350 fr.	$13.61	to $13.85
Wire rods, low C., No. 5 B.W.G.	585	to	615	23.09	to 24.30
Rails, light	740			29.20	
Black sheets, No. 31 gage, Japanese	1384	to	1476	54.68	to 58.32
				Cents a Lb.	
Steel bars, merchant	381	to	383	0.69	to 0.70
Beams, Thomas, British standard (nominal)	381	to	387	0.69	to 0.70
Channels Thomas, American sections	689	to	701	1.24	to 1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	378	to	384	0.68	to 0.69
Angles, Thomas, 3-in.	387	to	393	0.69	to 0.70
Hoops and strip steel over 6-in. base	492	to	510	0.90	to 0.92
Wire, plain, No. 8 gage	615	to	624	1.09	to 1.10
Wire, barbed, 4-pt. No. 12 B.W.G.	1045			1.87	

Says Industry Can Now Profit on Smaller Volume

"Changing tides of business cause powerful adjustments to take place in business," Bennett Chapple, vice-president of the American Rolling Mill Co., Middletown, Ohio, told members of the Cincinnati Electric Club at Cincinnati.

"The great changes that have taken place during the past 20 or 30 years in business have caused millions of people to change their mode of living, have revolutionized business practises and, in general, have played the principal part in present business conditions. It takes time for so many drastic changes to fit in with the scheme of things.

"One of the most hopeful signs for a return to normal in American business is the fact that at this time there is no necessity, as was the case in 1928 and 1929, of doing close to 100 per cent production in order for a business to make profit. Due to readjustments in tariff and retrenchments made by the businesses themselves, it seems now to be necessary to do only between 50 and 75 per cent production to show profits."

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Rust, McCann-Harrison in Working Arrangement

The Rust Engineering Co., Pittsburgh, and the McCann-Harrison Corpn., Cleveland, have united their organizations for the design and construction of sheet mill pack, pair and normal'zing furnaces which will be built under the combined patents controlled by both companies. The McCann-Harrison Corpn. will handle the sale of the above types of furnace equipment and will assist the Rust company in a technical and advisory capacity in the construction of the McCann type of furnace, as well as in development and research work on all sheet mill and conveyor furnace heating problems.

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New Distributing Outlet for Wheeling Oil Pipe

The International-Stacey Corpn., Columbus, Ohio, and the Wheeling Steel Corpn., Wheeling, W. Va., have completed arrangements for world-wide distribution of Wheeling oil country tubular goods to the oil and gas industry, through the sales organization of the International Derrick and Equipment Division of the former company. As rapidly as possible the International company will establish stocks of Wheeling tubular goods consisting of welded and seamless pipe throughout the active oil and gas fields at strategic distributing centers. This arrangement does not disturb the identities of the two companies, nor does it affect the existing distribution of Wheeling tubular goods through other channels.

The Wheeling line of welded and seamless oil country pipe includes A.P.I. and standard drill pipe, casing, tubing, line and drive pipe in a complete range of sizes and weights and thus enlarges the service of the International company to the industry. For the refinery and pipe line companies this arrangement immediately makes available Wheeling tubular goods in distribution centers close to their fields of activity.

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National Steel Earned 15c. a Share in Quarter

For the nine months ended Sept. 30, National Steel Corpn. reports net earnings of $3,774,610 after interest, depreciation, Federal tax and all charges, equivalent to $1.75 a share on 2,156,832 no par capital shares outstanding. For the three months ended Sept. 30, net earnings were $326,113 after all charges and Federal tax, equivalent to 15c. a share on the same capitalization.

"Although it is the company's practice to make semi-annual reports," E. T. Weir, chairman of the board of National Steel Corpn., stated in releasing the figures, "it is felt that the interest of the stockholders in the fact that the company is able to make profits during this period of extreme depression in the steel industry should be recognized by the publication of the report at this time."

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Two Chicago Warehouses to Be Consolidated

The Illinois Steel Warehouse Co. and the Scully Steel & Iron Co., two of the oldest and largest iron and steel warehouses in Chicago, will consolidate under the name of the Illinois-Scully Steel Warehouse Co., with offices and warehouses at 1319 Wabansia Avenue, Chicago, the present home of the Illinois Steel Warehouse Co. Charles H. Heggie, president, Scully Steel & Iron Co., will be president of the new company, and C. W. Shepherd, manager of the Illinois Steel Warehouse Co., will be vice-president.

The Scully Steel & Iron Co. was organized in 1890 by the late Alexander Scully. The Illinois Steel Warehouse Co. was originally the North Chicago Rolling Mill Co. Later it was a part of the Illinois Steel Co., but for some years it has been operating as a separate unit, although still controlled by the United States Steel Corpn.

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Wheeling Steel Corpn., in the quarter ended Sept. 30, had net loss of $718,927, compared with a profit in the corresponding period last year of $304,374. In the first nine months of 1931 the company's loss amounted to $1,935,755, compared with a profit of $2,655,955 in the corresponding 1930 period.

Bethlehem Steel Deficit $4,852,002 in Quarter

The Bethlehem Steel Corpn. reported a deficit of $1,502,002 in the third quarter, after deducting all charges, but before payment of dividends. The directors declared the quarterly dividend of $1.75 a share on the preferred and 50c. a share on the common. The total deficit for the period, after payment of $1,750,000 in preferred dividends and $1,600,000 for common stock dividends, is $4,852,002, against a deficit of $2,097,257 in the previous quarter. The quarter was the poorest experienced in 10 years.

Total income for the quarter was $3,954,960 against $6,394,057 in the second quarter and $8,943,217 in the first quarter. The provision for depletion and depreciation in the third quarter, at $3,526,781, was above that of the second quarter, which was $3,130,275.

The value of orders on hand Sept. 30 was $18,262,342, compared with $57,334,794 at the end of the preceding quarter. Operations averaged 32 per cent during the third quarter, and current operations are at 31 per cent.

President E. G. Grace stated that sentiment is better and that a very slight improvement has occurred in some departments of Bethlehem's business. He said that the price situation is fairly stable, and expressed the hope that the savings to be effected from wage cuts would not be given away by the steel companies in the form of lower prices. Explaining the poor record of the corporation in the third quarter, he said that Bethlehem's billing prices for the period averaged $1.59 a ton below those of the second quarter, were $2.22 below the average of the third quarter of 1930 and $3.27 below the average for all of 1930.

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Steel Castings Orders Lower in September

WASHINGTON, Nov. 2.—Orders for commercial steel castings in September declined to 23,043 tons, or 15.8 per cent, of the capacity of the 131 plants reporting to the Bureau of the Census, from 27,458 tons, or 18.9 per cent of capacity in August.

Production decreased to 26,898 tons, or 18.5 per cent of capacity, against 30,186 tons, or 20.7 per cent of capacity. For the nine months of the year, orders were 329,911 tons, or 25.2 per cent of capacity, compared with 741,371 tons, or 57.1 per cent of capacity in the corresponding period of last year.

September orders were distributed as follows: Railroad specialties, 6023 tons, and miscellaneous, 17,020 tons. The output consisted of 7265 tons of railroad specialties and 19,633 tons of miscellaneous castings.

Accurate Knowledge of Costs Vital

(*Concluded from page* 1165)

I have endeavored to point out the value of a few of the modern methods of accountancy that have proved their worth in practical operation and have contributed to effective business control through the medium of increased accuracy. Each method is a distinct subject in itself and much could be said about each. However, I feel that the value of such modern information has been brought out and I hope that it will provoke some thought in the minds of the business executive who does not now employ such methods. The talk of the day is about the tremendous amount of obsolescence of equipment existing in the manufacturing plants of the country. The same amount, more if anything, exists in the accounting offices, and its elimination and replacement with modern methods are much less costly and the value of the benefits derived are in much greater proportion.

A modern cost system is a profitable investment. Let's start a campaign for the replacement of obsolete cost systems, so that American business may take the fullest advantage of the period of prosperity that is just ahead.

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Continuous Ovens in Small Plants

(*Concluded from page* 1169)

transfer the loaded carriers from loading table to oven and remove the carriers of baked product from the oven to a second table, where the completed parts are removed from their carriers and loaded into boxes for shipment. Two girls, also, handle the unloading and the packing of the completed product.

In addition to the equipment just mentioned, the oven room contains a 550-gal. japan storage tank and adequate oven-carriage storage. The japan from the storage tank is pumped through a cheese cloth filter into the dip tank. The oven itself is a single-compartment unit 6 ft. 7¾ in. wide, 6 ft. 10½ in. high and 20 ft. from center to center of the sprockets. It is heated by electricity (G. E. resistors) from a 440-volt alternating circuit and has a connected load of 68 kw.

This entire unit is controlled through a 68/108-kw. automatic control panel with a Bristol automatic temperature regulator governing oven temperature. The ventilating system includes a No. 2 Garden City fan driven by a 1-hp., 1200-r.p.m. General Electric motor. The discharge is directly to a stack leading outside the building.

The conveyor is a two-chain unit spaced 6 ft. center to center of chains, with cross rods on 24-in. centers. It is driven from a head shaft through roller chain to a worm-gear reducer, through roller chain to a Reeves transmission, and through silent chain to the motor. The speed range of the conveyor is from 4 in. to 16 in. a minute, which is all the latitude desirable. A 1-hp., 1200-r.p.m. motor supplies the conveyor with power.

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Metals Used in Navy Dirigible Akron

(*Concluded from page* 1173)

equipment. Another generator provides 24-volt current for the operation of the telephone system and various electrical instruments. From the generators power goes to a switchboard which has 28 circuits.

Weight of electrical equipment was kept to a minimum by the use of aluminum or aluminum alloys in place of heavier metals. Each engine is provided with electric oil-heating device to facilitate starting the engines in cold weather. Small pumps for shifting fuel and ballast are located at various points. These are operated by three small movable motors.

Equipment includes a water ballast recovery system to convert exhaust gases of the engines into water which serves as ballast, compensating for the weight lost by the consumption of fuel and thus preserving the equilibrium of the ship. This apparatus consists of groups of panels made up of horizontal aluminum tubes connected by vertical headers. Between 90 and 110 lb. of water is recovered for 100 lb. of fuel.

An effort has been made to provide heat for the living quarters and control room by drawing air over the manifolds of two engines. This is forced through a large insulated aluminum pipe which runs under the floors of the living quarters and forward to the control car. The heat is discharged through registers.

Gasoline is stored in 110 aluminum tanks in three sizes, the majority of 120-gal. capacity and the largest holding 400 gal. For oil storage there are eight aluminum tanks, each of 1500-lb. capacity.

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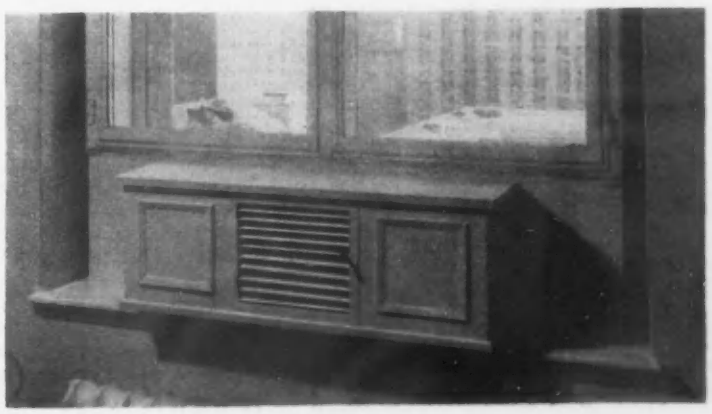
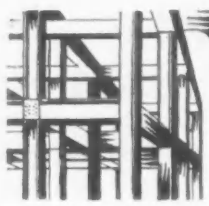
AN electrically driven silencer and air-filter for offices or conference rooms at industrial plants and in cities has been developed by the Campbell Metal Window Corpn., Baltimore, a division of the American Radiator & Standard Sanitary Corpn. The silencer, which was developed in conjunction with Hiram Percy Maxim, is contained in a metal window box formed of No. 12 gage sheets and weighing 60 lb. complete with the unit. Tests indicate that cleaned air is admitted with no more noise from the outside than through the closed window. Air is drawn in by a small motor and fan, cleaned by passage through a filter pad and projected into the room at an average of 250 cu. ft. per min. Without the filter pad, which may be replaced with a fresh one as required, the speed of the air current is 360 cu. ft. per min.





PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Sales Not Improving

Manufacturers Are Taking More Interest, However, in Possibilities of Reducing Production Costs

ALTHOUGH machine tool business has shown no improvement, the sale of repair parts continues to be fairly active, and in several sections of the country the smaller metal-working shops are getting busier. October was one of the poorest months in volume of sales that many tool builders and dealers have ever experienced.

One of the favorable signs of the moment is the willingness of many manufacturers to consider the savings that can in many instances be effected in their production costs by the installation of modern equipment. Orders are not often forthcoming, but the seeds are being planted by machine tool engineers and salesmen, and it is believed that a wave of equipment rehabilitation will come when industries are convinced that recovery from the depression is actually under way.

The Studebaker Corpn., South Bend, Ind., is getting prices on a few items of machine tool equipment, which may be a forerunner of some fairly good purchases by this company for the production of the new Rockne automobile. It is reported that manufacturing schedules will be started about Feb. 15.

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New York

Inquiries for one or two machine tools continue fairly active, but buying is still delayed in anticipation of evidence of an improvement in general business conditions. Buyers appear to be principally interested in special purpose tools, and in one instance a large manufacturer has installed new equipment, which will reduce cost of production on one article to one-sixth the previous amount. The General Electric Co., Schenectady, continues to buy single tools, and the Western Electric Co., Kearny, N. J., placed certain special equipment for a new department.

Milwaukee

Although inquiry is somewhat more active, orders are scarce and apparently are limited to most urgent requirements. Foundries and machine shops locally have as yet been unable to make substantial gains in production or employment, and industrial construction remains at low ebb. Demand for used tools is only fair.

Sale of the Kissel Motor Car Co. properties, at Hartford, Wis., by the receivers, scheduled for Oct. 27, has been postponed to Nov. 23.

Cincinnati

Except for a moderate demand for repair parts and scattered orders for single tools, there is nothing of interest in the machine tool market. Inquiries are only fair. Plants are maintaining operations at about one-third of output.

Chicago

Two phases of the Chicago machine tool market give indications of slight betterment. One of these is the fact that users are buying more small tools and machine tool parts, indicating that they are putting their equipment in condition for new work. The other favorable sign is that some of the smaller shops are busier, and here and there is found a manufacturer who is operating on double turn. It is reported that the Studebaker Corpn., South Bend, Ind., will go into production on its new Rockne car about Feb. 15. It is now taking figures on a few machine tools, and the trade understands that additional inquiries are to make their appearance. The International Harvester Co., Rock Island, Ill., is also interested in a few items of machine tool equipment.

Cleveland

There was little activity in the machine tool market the past week either in orders or inquiries, and October has been one of the worst months of the year with some of the machine tool builders and dealers. Plant managers are showing an interest in new and improved equipment designed to reduce production costs, but as a rule they are not inclined to replace present machinery until their plants are busier. Quite a number of the Ohio tool and die shops have become fairly busy with orders for jigs and fixtures, but operations by other metal-working plants show little improvement. Although there is little activity in electrical equipment, a 3000-kw. turbine was purchased by the State of Ohio for the Columbus Penitentiary, the order going to the General Electric Co.

New England

Dealers' sales continue few and far between. Activity in used tools consists of scattering sales of small, inexpensive tools, which in numerous instances are bought on long-term credits. New England machine tool builders are securing a few more inquiries, but no assurance that purchases will be made soon. Small tool sales are holding up comparatively well, but the average shop continues to buy only as necessity requires.

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New York

DEPARTMENT OF CORRECTION, State Office Building, Albany, N. Y., is asking bids until Dec. 10 for a new mechanical shop and power house at Sing Sing Prison, Ossining, N. Y.

American Machine & Metals, Inc., 15 Park Place, New York, has leased two floors in new Green Sixth Avenue Build-

THE JOHNSON FRICTION CLUTCH

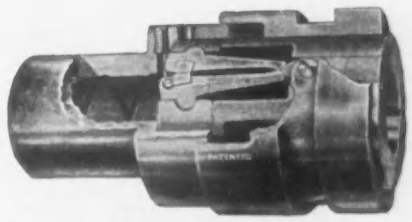
THE SUPER-JOHNSON

Single clutch with pulley mounted

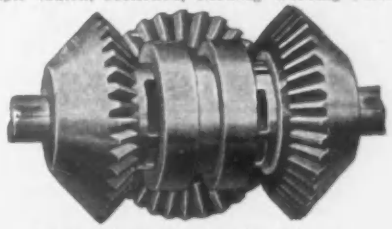
IS MADE STRONGER AND LASTS LONGER

WORKING PARTS are made of extra strong Chrome Nickel Steel — THE EXPANSION RING is reinforced opposite the point of expansion — THE ADJUSTMENT contains a locking device, all of which helps to make a rugged, reliable clutch.

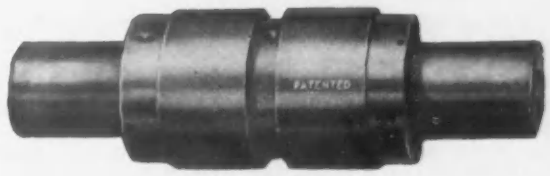
The expansion ring is faced O. D. with a special heat resisting material for such conditions as high speeds, heavy starting loads, excessive slipping or continuous engaging.



Single Clutch, Sectioned, Showing Working Parts



Double Clutch Between Bevel Gears



Double Clutch Exterior

SAFE
QUIET
COMPACT
RELIABLE

SEND FOR CATALOG "RED-11"

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

ing, near Holland Tunnel, for new plant with increased facilities.

Signal Supply Officer, Army Department, Army Base, Brooklyn, is asking bids until Nov. 16 for quantity of cable and four reels.

Jerome W. Huerrick, 10 West Conkling Avenue, Middletown, N. Y., and associates have organized Huerrick Engineering Works, Inc., and plan operation of factory for manufacture of machinery and mechanical equipment. John Arfmann, 219 Wisner Avenue, is interested in company.

Atlas Organ Co., 726 Jackson Avenue, New York, manufacturer of pipe organs and organ mechanisms, has plans for a new two-story plant, 45 x 100 ft., to cost about $50,000 with equipment.

Standard Oil Co. of New York, 26 Broadway, has awarded contract to Jones & Larson Corpn., 58-61 Fifty-fifth Street, Maspeth, L. I., for a one-story storage and distributing plant in Brooklyn, 50 x 150 ft.

New York Steam Corpn., 280 Madison Avenue, New York, contemplates expansion in connection with recent contract made with Pennsylvania Railroad Co. to furnish all steam requirements for Pennsylvania station; power, lighting, refrigerating and heating service at Pennsylvania Hotel, and for other operations. Pennsylvania company will discontinue operation of isolated power plant on West Thirty-first Street.

Board of Education, Yonkers, N. Y., plans installation of manual training equipment in new three-story high school, to cost $1,500,000, for which bids will soon be asked on general contract. G. H. Chamberlin and A. Fairbrook, 18 South Broadway, are architects.

Westchester Lighting Co., Mount Vernon, N. Y., has superstructure under way on a three-story equipment storage and distributing building, with service and repair department, at Peekskill, N. Y., to cost about $55,000 with equipment. J. Gregory is company architect.

Oehler Machine Co., Inc., Astoria, L. I., recently organized by William Oehler, 31-18 Broadway, Astoria, and associates, plans operation of works for production of baking and other equipment.

State Department of Architecture, State Office Building, Albany, N. Y., is asking bids for new one-story shop, with service and garage unit, for State Department of Public Works at Poughkeepsie, N. Y.

Board of Education, Springfield, N. J., plans installation of manual training equipment in new two-story and basement high school, to cost about $750,000. John T. Simpson, 744 Broad Street, Newark, N. J., is architect.

Welin Davit & Boat Corpn., 305 Vernon Avenue, Long Island City, N. Y., manufacturer of automatic davits, life boats, etc., has leased property at 8 Lister Avenue, Newark, N. J., for new plant. Company will remove to new location and increase capacity.

Farman-Standard Aircraft Corpn. of New Jersey, Inc., Paterson, N. J., care of Basil N. Bass, 22 East Fortieth Street, New York, attorney, has been organized to take over New Standard Aircraft Corpn., 230 East Sixteenth Street, Paterson, manufacturer of airplanes and parts, and will carry out development program. Harrison H. Tucker is one of incorporators.

Board of Education, Montville Township, Montville, N. J., is asking bids until Nov. 10 for an electric-operated pumping engine and auxiliary equipment.

American Colortype Co., 207 West Twenty-fifth Street, New York, has awarded general contract to Mark C. Tredennick & Sons, Inc., 24 West Forty-fifth Street, for extensions and improvements in two-story plant at Allwood, N. J., to cost over $50,000 with equipment. Ballinger Co., 100 East Forty-second Street, New York, is architect and engineer.

Bureau of Supplies and Accounts, Navy Department, Brooklyn, and Washington, is asking bids until Nov. 10 for four motor-driven engine lathes and one motor-driven woodworking machine for Brooklyn yard.

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South Atlantic

PUBLIC IMPROVEMENT COMMISSION, Baltimore, has authorized an industrial arts department in new school to be built at Hollins and Monroe Streets, to cost $424,917. Herbert J. Leimbach, City Hall, is supervising architect and engineer.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids until Nov. 11 for extensions and improvements in naval experiment station, Annapolis, Md.; also bids (no closing date stated) for a 90,000-gal. steel tank for naval fuel depot at Melville, R. I.

General Supply & Equipment Co., 601 North Calvert Street, Baltimore, has leased three-story building at 1419 Maryland Avenue, for new storage and distributing plant and will remove to new location. Henry C. Rippel is president.

R. H. Bozman & Brothers, Inc., 1046-54 Granby Street, Baltimore, manufacturer of built-in and sectional refrigerators, display cases, etc., contemplates a one-story addition to cost over $35,000 with equipment.

American Stores Co., 242 North Nineteenth Street, Philadelphia, wholesale grocer, has plans for a two-story and basement storage and distributing plant at Baltimore, with foundations for three additional stories, to cost about $125,000 with mechanical-handling and other equipment.

Burton Machine Co., Chestnut Street, Norfolk, Va., plans installation of equipment for manufacture of metal burial cases.

Celanese Corpn. of America, Inc., Amcelle, Md., has awarded general contract to Wright, Richardson & Co., Citizens Bank Building, Cumberland, for one-story addition, 66 x 170 ft., to cost over $100,000 with equipment.

Columbia Marble Co., Scottish Park, Knoxville, Tenn., has awarded general contract to Converse Bridge & Steel Co., Chattanooga, Tenn., for one-story plant, 150 x 300 ft., near Marble, N. C., including cutting, grinding, polishing and finishing departments, to cost close to $100,000 with equipment. Company is planning operations at new quarry near plant at Marble, and will install cutting, drilling and other equipment, majority to be electric-operated.

Construction Service, Veterans' Administration, Washington, will receive bids until Nov. 24 for three deep-well pumping units for Veterans' Hospital at Fort Lyon, Colo.

Buffalo

BIDS will be received by United States Engineer Office, Buffalo, until Nov. 10 for one forged steel tail shaft for pumping engine, two cast steel suction disk liners, four cast steel flanges and other equipment.

Spring Perch Co., Stratford, Conn., manufacturer of automobile leaf springs, has work under way on a new plant at Buffalo, totaling about 100,000 sq. ft. floor space. Stratford plant will be removed to new location, where production will be concentrated.

Leland D. Brady, 1828 Culver Road, Rochester, N. Y., and associates have organized Empire Development Corpn., and plan operation of factory for manufacture of heating equipment. Myron O. Bray, 105 Yorker Street, is interested in company.

John L. and Reginald Wells, Hornell, N. Y., are at head of project to purchase and reorganize local plant and business of A. J. Deer Co., manufacturer of meat choppers and cutters, meat slicers, etc., in receivership for several months. Operations will begin soon.

L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y., has perfected a new model portable typewriter, to be known as Sterling, and will carry out production at Corona plant, Groton, N. Y., giving employment to about 700 workers.

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New England

DEPARTMENT OF CORRECTION, Commonwealth of Massachusetts, State House, Boston, is considering erection of a one-story mechanical building at State Farm, Bridgewater. William T. Hanson is acting superintendent at institution.

Thompson Wire Co., 41 Mildred Avenue, Boston, has taken over about 10,000 sq. ft. additional floor space for expansion.

Quincy Oil Co., 58 Federal Avenue, Quincy, Mass., has plans for new bulk oil storage and distributing plant, with automobile service and repair unit, to cost over $200,000 with equipment. G. E. St. Laurent is company architect, address noted.

American Flexible Conduit Co., New Bedford, Mass., recently organized by John H. Abrams, 110 Norman Street, and associates, plans operation of factory for manufacture of armored cable and electrical equipment.

New England Steel Rack Co., Salem, Mass., has leased part of building on Central Wharf for expansion.

School Committee, Winchester, Mass., plans installation of manual training equipment in new two-story and basement junior high school, to cost close to $225,000, for which general contract has been let to Delaney Construction Co., Bay State Building, Lawrence, Mass.

Leavitt Machine Co., Orange, Mass., manufacturer of steam specialties, valve-reseating machines, etc., has arranged for new unit for production of steam separators and parts.

Bureau of Supplies and Accounts, Navy Department, Portsmouth, N. H., and Washington, is asking bids until Nov. 10 for one molding machine for Portsmouth

IF--

You are willing to buy a short-lived radial—

You are content to pay heavy repair and maintenance bills—

You want to continue with the expensive and obsolete method of squirt-can oiling—

You are satisfied to walk from one end of the machine to the other to shift speed box gears and clamp the column, every time a hole is drilled—

You wish to pay the price of early obsolescence—

You are willing to sacrifice efficiency on the altar of low first cost—

THEN—almost any Radial Drill will serve your purpose;

BUT--

If you want the same fine radial drill service year in and year out—

If your specifications require that all speed and feed changes be centralized in the head—

If you must have power column clamping, controlled from the head—

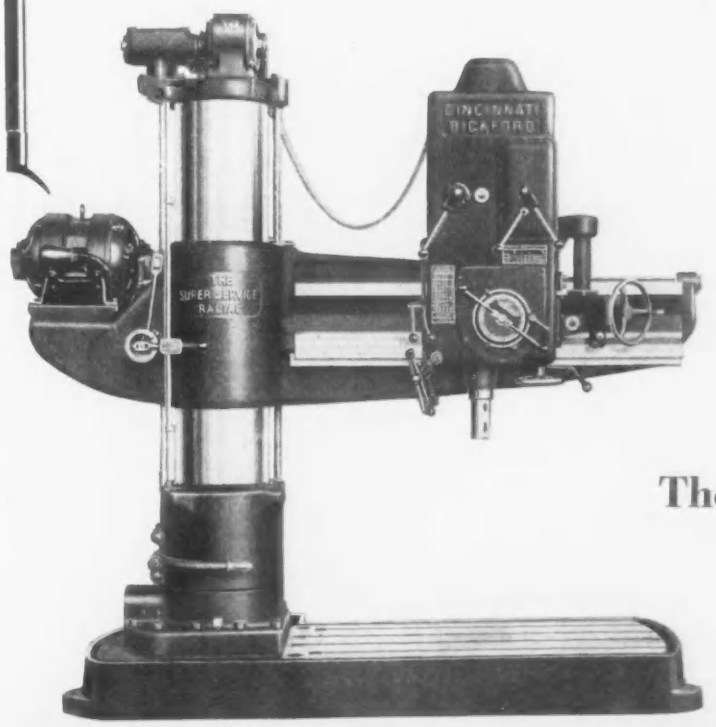
If you insist on a single lever to clamp, unclamp, raise and lower the arm—

If you are satisfied only with automatic lubrication throughout—

If you specify that the entire drive must revolve in Timken Tapered Roller Bearings—

If you designate that every shaft be Multiple-Splined, and that all speed and feed changes be made through selective sliding gears—

If, in the interest of economy and efficiency, your production men demand that the handling time be reduced to the bed-rock minimum—



THEN—only the Super Service Radial Drill will serve your purpose!

The Cincinnati Bickford Tool Co.

Oakley, Cincinnati, Ohio, U. S. A.

yard, until Nov. 17 for 6000 toggle switches.

New England Collapsible Tube Co., New London, Conn., manufacturer of metal tubing, is operating at capacity and contemplates further expansion in output for both domestic and foreign account.

United Aircraft & Transport Corpn., Hartford, Conn., has secured order for Wasp junior aircraft motors for 18 two-place observation airplanes, for which contract recently was secured by Berliner Joyce Aircraft Corpn., Baltimore.

A compressor, drills and other equipment will be required for addition to plant of Menderth, Inc., Byron, Me., for which $50,000 will be spent.

Keene Foundry, Inc., Keene, N. H., has plans for units to replace those destroyed by fire recently.

Viking Flying Boat Co., East Haven, Conn., will take bids about Nov. 6 on an airplane hangar and shop. Lenox Brothers Flying School, South Street, West Haven is lessee.

Massachusetts Department of Education has plans for a $1,000,000 nautical training school at Cambridge. John C. Spofford, 53 State Street, Boston is engineer.

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Philadelphia

BIDS have been asked by Ford Motor Co., Dearborn, Mich., for a one-story addition to assembling plant at Chester, Pa., including improvements in present works, to replace in part a recent fire loss, to cost over $200,000. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Naval Aircraft Factory, United States Navy Yard, Philadelphia, is asking bids until Nov. 12 for 100 air compressors, 1000 magneto files, 4610 wrenches, 300 chisels, etc.; until Nov. 9 for 350 reversible ratchet handles and 100 allenhead wrenches.

John Barber, Inc., Philadelphia, Pa., has been organized to take over and expand plant and business of John Barber, 9734 Bustleton Avenue, manufacturer of automobile bodies, parts, etc. John Barber and John Barber, Jr., head new organization.

William J. Ellis, commissioner of Institutions and Agencies, State Office Building, Trenton, N. J., is asking bids until Nov. 12 for deep-well pumping machinery for State prison farm, Bordentown, N. J.

Board of Education, Camden, N. J., contemplates installation of manual training equipment in addition to high school to cost over $175,000, for which bids are being asked on general contract until Nov. 9. Byron H. Edwards, Inc., Camden, is architect.

Board of Education, Delaware City, Del., contemplates installation of manual training equipment in addition to high school to cost $126,000, for which bids will be received on general contract until Nov. 17, by Delaware School Auxiliary, Wilmington. Guilbert & Betelle, Chamber of Commerce Building, Newark, N. J., are architects.

Bureau of Yards and Docks, Navy Department, Navy Yard, Philadelphia, will receive bids until Nov. 17 for 250 hand fuel pumps.

Lackawanna Railroad Co., Hoboken, N. J., will increase operation at shops to a four-day week basis instead of three days. Similar advance will be made at repair shops at Kingsland, N. J. About 1200 men will be employed at both plants.

Edward G. Budd Mfg. Co., Philadelphia, has been granted exclusive rights to manufacture machines for producing rayon yarns under patents of Furness Corpn., Gloucester, N. J.

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Cincinnati

CONTRACT has been let by Refiners, Inc., 11 West Monument Avenue, Dayton, Ohio, to Holt & Reichert, 12 East McMillan Street, Cincinnati, for bulk oil storage and distributing plant at Cincinnati, to cost about $55,000 with equipment.

Kruckemeyer & Schrader Foundry Co., Blanchester, Ohio, care of J. Sagmeister, Traction Building, Cincinnati, attorney, recently organized by Richard L. Kruckemeyer and Charles H. Schrader, Blanchester, plans operation of foundry for manufacture of iron and other castings.

Department of Highways, Hartman Building, Columbus, Ohio, has asked bids on general contract for a two-story equipment service, repair and garage building, 60 x 120 ft., at Middletown, Ohio. John P. Schooley, Hartman Building, is architect.

Contracting Officer, Wright Field, Dayton, Ohio, will receive bids until Nov. 9 for three suspended hopper scales; until Nov. 10 for 30 bomb release handle assemblies; until Nov. 11 for three 250-kva. transformers and accessories.

Standard Oil Co. of Kentucky, Ashland, Ky., has plans for an addition to bulk oil storage and distributing plant, with tanks and other equipment, to cost over $90,000. Company is also considering oil storage and distributing terminal on Ohio River, to cost over $100,000.

Simrall Refining Corpn., Union Central Building, Cincinnati, has acquired land, with river frontage of 1000 ft., near Amherstburg, Ont., as site for new gasoline refinery. Initial unit will cost over $150,000 with equipment. Later expansion will be carried out for production of kerosene, lubricating and other oils. Plant will be operated in name of Simrall Refining Corpn. of Canada, Ltd.

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Cleveland

BOARD of Trustees, University of Akron, Akron, Ohio, has awarded general contract to Indiana Engineering & Construction Co., 109 North Union Street, for Guggenheim aeronautical research building, to cost about $100,000 with equipment. M. M. Konarski, Central High School Building, is architect.

Ohio Ice Co., Zanesville, Ohio, has plans for extensions in plant No. 1, including additional equipment, to cost about $50,000.

Alloy Foundry & Machine Co., Toledo, Ohio, care of Fraser, Hiett, Wall & Effler, Home Bank Building, attorneys, recently organized by W. T. Walker and associates, plans operation of foundry for production of metal alloy castings, etc.

Goodyear Tire & Rubber Co., Akron, Ohio, has plans for two-story factory branch, service, storage and distributing building at Cleveland, to cost about $100,000 with equipment.

Board of Directors, Mahoning Valley Sanitary District, 901 City Bank Building, Youngstown, W. H. Dittoe, chief engineer, will receive bids until Nov. 13 for pneumatic conveying machinery for handling chemicals, etc., at head house, Meander Creek Water Purification Works, including electrical control equipment, etc.

Geometric Stamping Co., 1111East 200th Street, Cleveland, is advancing operations due to increased orders. Unfilled orders are 70 per cent in excess of this time a month ago.

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Gulf States

COMMANDING Officer, San Antonio Arsenal, San Antonio, Tex., is asking bids until Nov. 19 for one all-metal motor-driven compressor unit, one 3-gal. pressure tank paint container, and for one spray gun.

Board of Tangipahoa Parish School Commissioners, Amite, La., contemplates installation of manual training equipment in new two-story and basement high school at Kentwood, La., to cost about $100,000, for which bids are being asked on general contract until Nov. 19. Favrot & Livaudais, Nola Building, New Orleans, are architects,

Peterson-Woodruff Oil Co., San Antonio, Tex., is planning erection of new oil refinery near Harlingen, Tex., to cost over $60,000 with equipment. Plant will secure crude oil supply through pipe line from oilfields at Refugio, Tex.

Dent Ornamental Iron & Wire Corpn., Birmingham, recently organized by J. L. Dent and associates, has taken over plant of Daniels Ornamental Iron & Wire Corp. and will continue operation for production of wire partitions, wire guards for machinery, coal screens, etc.

Superintendent of Lighthouses, New Orleans, will receive bids until Nov. 10 for furnishing two marine Diesel engines and accessories for lighthouse tender.

Lowndes County Board of Education, Columbus, Miss., J. R. Vaughan, superintendent, is planning erection of one-story vocational training shop, 50 x 60 ft., at consolidated school at Caledonia, Miss.

Orleans Levee Board, New Orleans, A. L. Shushan, president, will build three hangars, each 100 x 200 ft., with repair shops, to cost $240,000 with equipment, in connection with new airport on Lake Pontchartrain, to be known as Shushan Airport. Project will also include administration building to cost $190,000 and other field units to cost $200,000. Entire development will cost more than $2,000,000. National Airport Engineering Co., 775 East Washington Street, Los Angeles, is engineer. John Klorer is engineer for board.

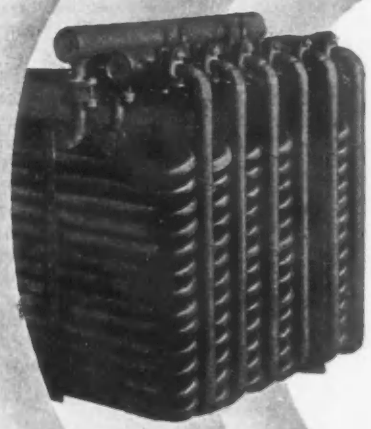
Marshall Cotton Oil Co., Marshall, Tex., has awarded a general contract to Frank Moos & Son, Marshall, for two-story storage and distributing plant, 50 x 160 ft., to replace structure recently destroyed by fire.

Quartermaster Corps, Fort Bliss, Tex., will receive bids until Nov. 18 for a deep well turbine pump, pump house with derrick, pipe line with fittings, etc., at post pumping plant; until Nov. 9 for two multivane fans, two air filters, two air washers, air conditioning system, switches, etc.

Mississippi Industrial Gas Co., Jackson, has secured franchise for natural gas

BENDING AND COILING

This Pipe is made for it!



PIPE that is to be used for bending, coiling, flanging and other special purposes should always be selected with a definite knowledge of its fitness for the particular purpose in mind. To bend easily and smoothly without wrinkling or buckling is entirely practical if the right pipe is used. For those who regularly manipulate pipe, it is highly important to specify a pipe that will make bends, coils, loops, offsets and crossovers with a minimum of time, labor and material.

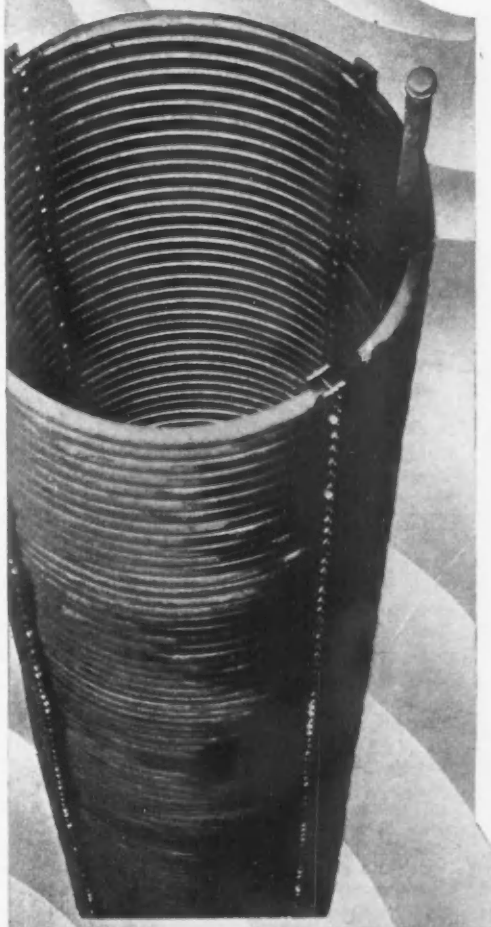
National Tube Company manufactures a grade of pipe especially for bending, coiling and flanging purposes. It is unusually strong and unusually ductile—the result of high quality materials, special processes, special tests and inspections—all under the supervision of skilled workmen who understand the requirements of bending and coiling practice.

But ductility is not all. NATIONAL Pipe is also extra resistant to corrosion—clean and smooth inside and out, making it particularly suitable for galvanizing or special coatings.

For additional protection against atmospheric corrosion, (wherever pipe is subjected to alternate wet and dry conditions) NATIONAL Copper-Steel Pipe is recommended.

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY • Pittsburgh, Pa.
Subsidiary of United States Steel Corporation



NATIONAL PIPE

supply at Crystal Springs, Miss., and plans installation of plant and system.

Texas Carbonic Ice Co., 703 Linz Building, Dallas, Tex., is being organized by local interests, headed by Charles G. Cragin, and plans erection of dry ice-manufacturing plant, to cost over $125,000 with machinery.

City Council, Magnolia, Miss., plans installation of electric-operated pumping machinery and auxiliary equipment in connection with additional water supply. Henry A. Mentz & Co., Hammond, La., are consulting engineers.

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Milwaukee

INVESTMENT of from $75,000 to $100,000 in new machinery and other equipment early in 1932 is contemplated by American Black Granite Co., Ashland, Wis., following acquisition of additional quarries at Ashland and Mellen, Wis.

General Grinder Corpn., 240 North Milwaukee Street, Milwaukee, has changed its corporate title to General Hardware Corpn., to better describe its present line of tools and devices, in addition to original line of tool grinders. Van B. Hooper is president and general manager.

DePere Paper Mfg. Co., DePere, Wis., contemplates immediate erection of new paper mill costing about $200,000 to replace plant destroyed by fire recently. Herman Miller, 125 South Van Buren Street, Green Bay, Wis., is general manager.

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Pittsburgh

PLANS are under way by J. Villard Frampton and Dale F. Logan, Oil City, Pa., for organization of International Refineries, Inc., and erection of refinery, for production of lubricating oils, etc., to cost over $100,000 with equipment. James H. Courtney, Oil City, is interested in company.

Board of Education, Shaler Township, Glenshaw, Pa., plans installation of manual training equipment in new three-story and basement high and grade school, to cost over $200,000, for which bids will soon be asked on general contract. Ingham & Boyd, Empire Building, Pittsburgh, are architects.

Union Die Service Corpn., Pittsburgh, recently organized by Herbert B. Clark, Webster Hall, and associates, plans operation of factory for manufacture of dies, tools and other equipment. Morris Simons, 7 West Eighty-first Street, New York, will be treasurer of company.

Hamilton Standard Propeller Co., Homestead, Pa., recently organized to take over Hamilton Standard Propeller Corpn., with plant for manufacture of airplane propellers, etc., will remove to Hartford, Conn., occupying part of works of Pratt & Whitney Aircraft Co., where production will be concentrated. Company is a subsidiary of United Aircraft & Transport Corpn., Hartford.

A. F. Thompson Mfg. Co., Huntington, W. Va., manufacturer of gas stoves, burners, etc., has advanced production to 14 hr. a day, giving employment to more than 200 persons.

St. Louis

CITY Council, Sullivan, Mo., N. W. Shaffer, city clerk, will receive bids until Nov. 12 for municipal power plant, 45 x 50 ft., including two Diesel engines, generators, oil storage tank of 15,000 gal. capacity, water cooling tower and other equipment. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, is engineer.

Artificial Ice Co., 3715 Easton Avenue, St. Louis, has plans for one-story plant to cost close to $40,000 with machinery.

Board of Education, Kansas City, Mo., plans installation of manual training equipment in addition to East high school, to cost about $400,000, for which bids will soon be asked on general contract. Charles A. Smith, Finance Building, is architect; Nate W. Downes, Finance Building, is mechanical engineer.

Morris-Collier Quicksharp Co., 200 Central Avenue, Monett, Mo., has plans for new one-story factory for manufacture of razor-sharpening machines and parts, to cost about $25,000 with equipment.

Common Council, Altamount, Kan., is considering installation of a new municipal gas plant and distributing system. An election will be held to approve bond issue.

City Council, Lee's Summit, Mo., has called special election on Nov. 10 to vote bonds for $50,000, for a municipal electric lighting plant and system. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Vitric Products Co., Commerce Exchange Building, Oklahoma City, has taken option on former plant of Ranger Aircraft Co., and plans expansion for production of line of glass products, to cost close to $150,000 with machinery. Company has over 50 acres of silicon oxide deposits in Delaware County, for source of raw material and will install mining, loading and other equipment. F. W. Fenton, address noted, is company engineer.

D. W. Hill, Excelsior Springs, Mo., and associates have acquired properties of Wappapello Land & Iron Co., under foreclosure proceedings, comprising about 11,000 acres of ore lands in Wappapello district, Wayne and Butler Counties. Plans are under way for development of part of site, and installation of mining and other eqipment.

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Chicago

BIDS have been asked on general contract by Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, for rebuilding coach and repair shops at Aurora, Ill., one-story, 210 x 360 ft., recently destroyed by fire, with loss of about $350,000 including equipment.

John T. Cunningham Ice Cream Co., 2235 West Van Buren Street, Chicago, has awarded general contract to James Sheldon & Co., 208 West Washington Street, for four-story plant, 124 x 162 ft., to cost about $300,000 with equipment.

City Council, Kenyon, Minn., has been authorized to arrange bond issue of $40,000 for a municipal electric light and power plant.

Montana Lead, Inc., Helena, Mont., E. G. Toomey, Helena, secretary and representative, is considering erection of new flotation plant at Rimini, Mont., to cost close to $60,000 with equipment.

City Council, Glidden, Iowa, is asking bids until Nov. 10 for a municipal light and power plant, including two 150-hp. Diesel engines, tank and cooling system, switchboard, etc. Henningson Engineering Co., Union State Bank Building, Omaha, Neb., is engineer.

Village Council, Wilmette, Ill., plans installation of electric-operated pumping machinery and other equipment in connection with new municipal waterworks to cost $600,000. An election has been called on Dec. 5 to vote bonds in amount noted. Pearse, Greeley & Hansen, 6 North Michigan Avenue, Chicago, are engineers.

Foote Bros. Gear & Machine Co., 215 North Curtis Street, Chicago, announces that negotiations for a merger with Dodge Mfg. Co., Mishawaka, Ind., have been abandoned.

City Council, Bellevue, Iowa, is asking bids until Nov. 17 for extensions and improvements in municipal electric light and power plant.

Factory Supply Co., Waukegan, Ill., plans rebuilding part of storage and distributing plant recently destroyed by fire, with loss of $50,000 including equipment.

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Detroit

DEPARTMENT of Municipal Service, Wyandotte, Mich., has awarded general contract to H. G. Christman-Burke Co., Detroit, for addition to municipal electric light and power plant, 70 x 100 ft., to cost about $150,000 with equipment. Froehlich & Emery Engineering Co., Second National Bank Building, Toledo, Ohio, is engineer.

Paper Makers Chemical Corpn., Kalamazoo, Mich., manufacturer of industrial chemicals, contemplates expansion at branch plant at Savannah, Ga., to cost about $100,000 with machinery.

Advance Metal Products Corpn., 925 Stanley Avenue, Detroit, recently organized by C. M. Mumford and M. W. Hull, plans operation of works for manufacture of sheet metal products.

Calumet & Hecla Copper Co., Calumet, Mich., is carrying out an electrification program at Tamarack properties, to include compressor and other operating units.

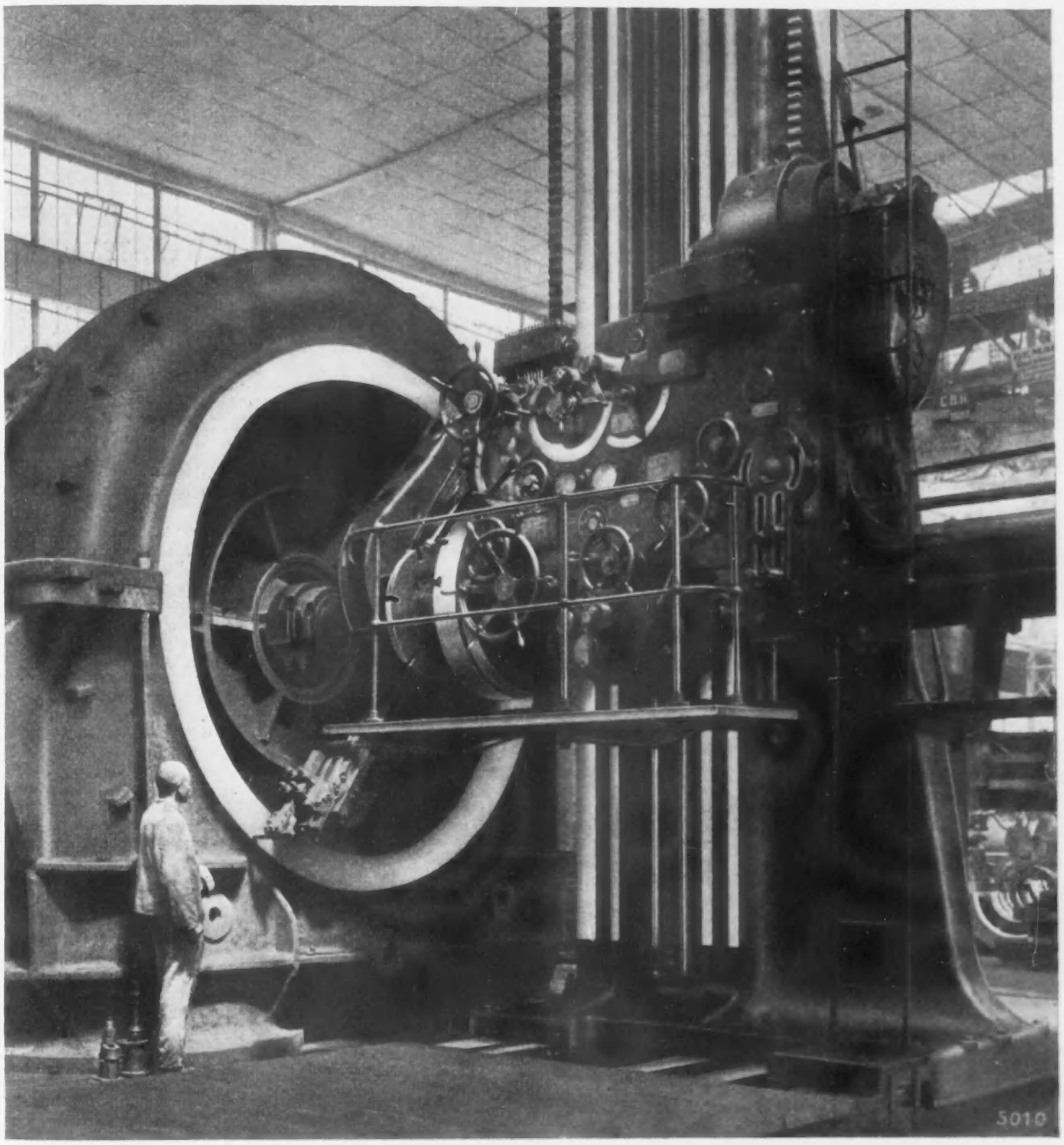
Officials of Baldwin Rubber Co., Pontiac, Mich., are organizing Baldwin Rubber Co. of Canada, Ltd., a subsidiary, to establish a plant in Canada. It is proposed to dispose of bond issue of $225,000, part of fund to be used for new works.

Safe-Flyer Association, Ltd., 937 East Larned Street, Detroit, recently formed by a consolidation of Wingler Aeronautical Corpn., formerly operating a plant at Imlay City, Mich., and other aeronautical interests, will establish plant for production of special airship for instruction of novices, operating on overhead electrified rail, and for service also as an airplane amusement device. Both parts manufacture and assembling will be carried out.

Detroit Edison Co., 2000 Second Avenue, Detroit, has plans in engineering and architectural divisions for an addition to Connors Creek steam-operated electric power station, to cost about $1,000,000 with machinery.

Board of Works, Marquette, Mich., plans expansion at municipal waterworks, including installation of electric-operated pumping machinery and auxiliary equip-

Schiess-Defries



Large Modern Boring and Milling Machine

Machining an Exhaust Casing of a 44,000 kw. Condensing Turbine

Schiess-Defries A.-G. Düsseldorf

Germany

REPRESENTATIVE: For U. S. A.: U. Kauermann, Fountain Square Bldg., Cincinnati, O.

ment, to cost about $45,000. Pearse, Greeley & Hansen, 6 North Michigan Avenue, Chicago, are engineers.

Ray C. Loranger, 18976 Waltham Street, Detroit, and associates have organized Apex Broach Co., headquarters at 2981 East Lafayette Street, to operate plant for manufacture of broaches and broaching fixtures, special tools, etc. Gustav E. Readbloom, Detroit, is interested in company.

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Indiana

CONTRACT has been let by Wayne Co., Tecumseh Street, Fort Wayne, manufacturer of pumping machinery, parts, etc., to Indiana Engineering & Construction Co., Central Building, for one-story addition, 50 x 80 ft., sawtooth roof type.

West Dodd Lightning Rod Co., Inc., Goshen, has been organized to take over 12 manufacturers of lightning rods, fixtures and auxiliary equipment. Main works will be at plant of Goshen Lightning Rod Co., one of units, and expansion will be carried out, including erection of one-story brass foundry to cost over $40,000 with equipment. A. G. Hoovens, heretofore head of Goshen Lightning Rod Co., will be president and general manager of new company.

Beach & Arthur, Inc., 221 West South Street, Indianapolis, manufacturer of paper products, plans one-story addition, 40 x 100 ft., to cost close to $45,000 with equipment.

Langsenkamp-Linkert Carburetor Co., Indianapolis, recently organized as a division of Langsenkamp-Wheeler Brass Works, 1234 Shelby Street, is arranging for operation of new plant at Shelby and Sanders Streets for manufacture of full line of carburetors. Carburetor jackets will be of brass, to be produced at works of parent company. H. W. Linkert, formerly chief engineer of Wheeler-Schebler Carburetor Co., will be president of new company; A. M. Lang is vice-president in charge of production.

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Pacific Coast

BOARD of Education, 1151 South Broadway, Los Angeles, has authorized installation of manual training equipment in new school at North Hollywood, to cost about $75,000. Henry C. Newton and Robert D. Murray, Architects' Building, are architects.

Charles Gabriel, San Bernardino, Cal., is planning one-story electric-operated ice-manufacturing plant at San Diego, Cal., to cost $45,000 with equipment.

State Department of Public Works, Public Works Building, Sacramento, Cal., is asking bids until Nov. 10 for a 100,000 gal. capacity steel tank at State hospital at Agnew.

J. W. Minder, 1842 Alpine Drive, San Marino, Cal., and associates have organized J. W. Minder Chain & Gear Co., Ltd., Los Angeles, to operate plant for manufacture of gears, sprockets, chains, etc. Earnest A. Minder, Los Angeles, is interested in company.

Madera Irrigation District, Madera, Cal., is considering proposal to build new gravity water supply system, to include erection of electric operated pumping plants to cost $458,000, and hydroelectric power plant to cost $1,400,000. Entire project, including pipe lines, etc., will cost $14,601,114.

State Department of Works, Ferry Building, San Francisco, Frank G. White, engineer, has plans for a four-story addition to ice and precooling terminal at China Basin, Cal., to cost about $500,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Pugent Sound Navy Yard, Seattle, and Washington, will receive bids until Nov. 17 for one crane, one nitriding outfit and one extra retort (schedule 6839).

Secretary, Junior College Board, Marin Junior College District, Kentfield, Cal., will receive bids until Nov. 12 for mechanical engineering equipment, materials and supplies; also, for science laboratory equipment, materials and supplies.

Board of County Supervisors, San Diego, Cal., is considering erection of an equipment storage and distributing plant, with automobile service, repair and garage building, to cost over $150,000 with equipment.

City Council, Coeur d'Alene, Idaho, has engaged Franklin R. Wood, Coeur d'Alene, engineer, to make survey and plans for municipal electric light and power plant, to cost over $600,000 with equipment.

International-Stacey Corpn., Columbus, Ohio, has completed for Superior Oil Co. at Ventura, Cal., a steel derrick, 178 ft. high with a 32-ft. square steel base, which company says is tallest derrick in world.

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Canada

LAKE SHORE MINES, Ltd., Kirkland Lake, Ont., has completed foundations for addition to mill to step ore treatment up from 2500 tons to 4000 tons a day. Some new equipment will be installed.

Dome Mines, Ltd., head office, 36 Toronto Street, Toronto, has started work on an addition to its mill at Porcupine, Ont.

Granada Gold Mines, Ltd., Rouyn, Que., will start work immediately on a transmission line to take power into its property. Company also will install considerable new mining equipment, including a 15-drill compressor, and enlarge mill to bring treating capacity from 70 tons to 150 tons a day. Robert C. Gamble, 1105 Federal Building, Toronto, is president.

Superior Chain Plating Co., Ltd., whose factory at Tilbury, Ont., was destroyed by fire some time ago, has plans for a new plant at Ridgetown, Ont. John Slasarchuck, Tilbury, is manager.

James Bodie Construction Co., Ltd., 456 Pape Avenue, Ont., will erect a one story factory at 154 Duke Street, 41 x 140 ft., with wing, 40 x 40 ft.

Zonite Products Corp., Ltd., 385 St. Paul Street west, Montreal, will erect a factory at Ste. Therese, Que., to cost $40,000. Machinery installation will cost between $60,000 and $75,000.

City Council, Cranbrook, B. C., will discontinue purchase of power next spring from East Kootenay Power Co., and proposes to erect its own power plant. Council is receiving bids and information for generating plant, either steam or Diesel, as no water power is available. F. W. Burgess is city clerk.

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Foreign

OFFICIALS of General Electric Co., Schenectady, N. Y.; German AEG, Berlin, and Alsthom, Paris, an interest of General Electric Co., have formed joint company under name of Geathom, Ltd., Madrid, to operate under Spanish laws. New company plans early erection of plant in Spain, primarily for manufacture of electric railroad equipment. Large part of initial output will be used for immediate electrification project on several Spanish lines.

State Ministry Department, Paris, Pierre-Etienne Flandin, finance minister, is arranging for expansion and improvements, including fund of $20,000,000 for improvement and modernization of ports with mechanical-handling and other equipment; $6,000,000 for development of civil aviation, including airports, hangars, etc.; $24,000,000 for electrification work in provincial district, comprising power facilities and transmission lines, and $2,000,000 for improvement and operation of river, navigation in different parts of country.

Department of Civil Aviation, Soviet Russia Government, Moscow, is arranging bond issue of 50,000,000 rubles (about $25,000,000), proceeds to be used for construction and development of air lines, including air ports with hangars, shops, and other operating facilities.

Government of Venezuela, Caracas, is arranging fund of $500,000 for extensions and improvements in harbor at Port of La Guaira, including new warehouses and other buildings, installation of electric traveling cranes, track materials, conveying and other equipment.

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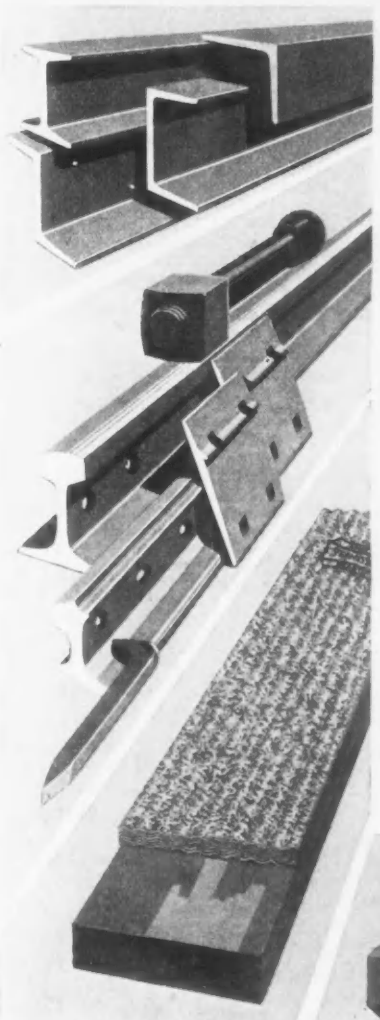
Studies New Solutions for Quenching Steel

A steel equivalent to or possibly better than the quenched and tempered steel would often be a possibility if quenching solutions were available possessing characteristic cooling rates between those of water and oil, according to the Bureau of Standards, which has made an investigation of aqueous solutions of ethylene glycol, glycerine, and sodium silicate to determine whether any of them offered promise as quenching media.

It was found that the solutions of glycol and of glycerine did not give results which were readily reproducible. Hence, such solutions do not appear promising for practical use. However, solutions of several concentrations of sodium silicate proved to have quenching rates in the desired intermediate range and to give very consistent results. Some of these sodium silicate solutions must be treated with small additions of caustic soda in order to prevent changes in them when allowed to stand for several months. The effect of varying the concentration and the temperature of the sodium silicate solution was studied. It was concluded that sodium silicate solutions give promise in the quenching of steels by providing solutions having graded cooling rates between those of water and oil.

TENNESSEE Steel

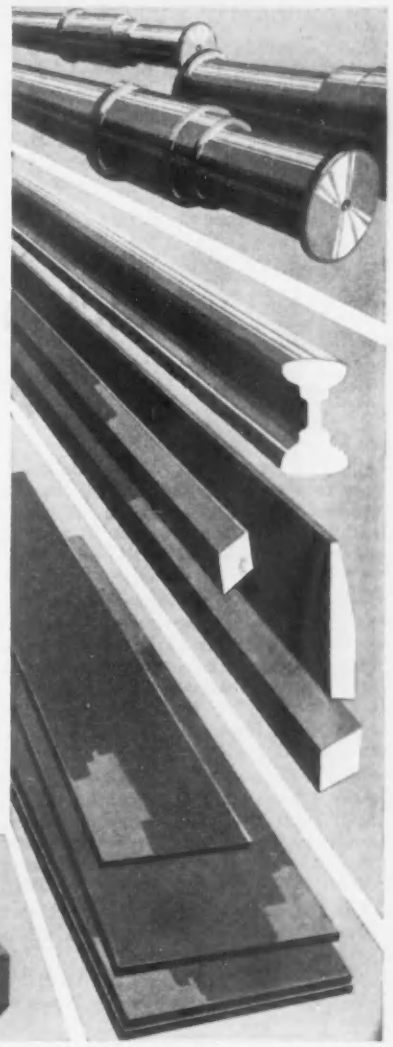


Start with *the* Right Steel . . .

WHETHER you are a consumer of steel or a purchaser of steel for conversion into other forms, you well realize the necessity of starting with a good product.

There is no surer way of selecting a first class steel product than to purchase from a concern with a good name.

When you settle on Tennessee as your source of supply, you have taken a most important step in your selection of materials. You *know* that the quality will be *right*, the size will be *right*, the finish will be *right*, and the shipment *right* when you want it.



TENNESSEE COAL, IRON & RAILROAD COMPANY

General Offices: Brown-Marx Building, Birmingham, Ala.

Subsidiary of United States Steel Corporation

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
ILLINOIS STEEL COMPANY
MINNESOTA STEEL COMPANY
NATIONAL TUBE COMPANY
OIL WELL SUPPLY COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R. R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif. *Export Distributors*—United States Steel Products Company, 30 Church Street, New York, N. Y.

Business as Others See It

Digest of Current Financial and Economic Opinion

SENTIMENT is distinctly better, though not statistically; such a report comes from a variety of sources. But no one predicts immediate business recovery; next spring—may be.

Preservation of currencies is held the key to the whole situation. "Substantial recovery in business volumes and commodity prices," says Harvard Economic Society, "is unlikely so long as present unsettlement in banking and financial conditions persists, though stabilization at depression levels is clearly possible." Decline in gold withdrawals and decreased hoarding are held to augur, if continued, "that the acute phase of the financial crisis is over."

Need for further downward price readjustments is believed by Alexander Hamilton Institute to militate against better business early in 1932. Nevertheless, "if the upward tendency in raw material prices means that the long decline has been definitely halted, . . . business has at last reached the bottom of the depression."

Brookmire notes a "threat to those capital values in which a large part of the savings of the nation is invested; slowing up of the country's rate of growth; discontent of the debtor class, which is coming to be expressed in a demand for abrogation of the gold standard."

That organization says that "the chief significance of the [railroad rate] decision is that it recognizes for the first time, in a period not dominated by war conditions, a degree of public responsibility for the solvency of the railroads." That decision is declared by Silberling "the most important economic factor during the week [of its issuance]. The main result will be to throw powerful and speedy emphasis upon the wage question."

British elections loom large in the prospect of a protective tariff which cannot but have repercussions here. *Annalist* holds this the most emphatic development of the week, classing the Hoover-Laval conference next. So does *Financial Chronicle*, but with the observation that the latter was characterized by no friction and no commitments.

Commerce and Finance cannot believe "that things will be permitted to drift until the inevitable revolutions and wars result. It has been clearly demonstrated that isolated prosperity in an unstable and disorganized world is a fantasy."

It sees the National Credit Corpn. as "not only decreasing necessitous liquidation of bonds from institutional sources, but curbing unwarranted and unnecessary deposit withdrawals from sound banks."

Machinery Exports in September Were Best Since June

WASHINGTON, Oct. 29.—Machinery exports in September rose to a value of $24,715,000 from $20,354,000 in August, a gain of $4,361,000, and the best total since that for June. A still greater increase was made in industrial machinery, whose exports, as classified by the Division of Statistics, Department of Commerce, aggregated $14,690,000 as compared with $10,036.000, a rise of $4,654,000.

Exports of power-driven metal-working machinery also shared prominently in the increases, rising to a value of $5,055,073 as against only $2,239,358 in September of last year. Machine tools exports increased 111 per cent in September, with a value of $3,861,000, over August, with a value of $1,825,000. Exports of machine tools in September of last year aggregated $1,839,000.

Other important gains made in September of the present year over August were in locomotives, which rose to a value of $1,130,000 from nothing; excavating machinery, mining and quarrying machinery; oil-well machinery and other metal-working machinery. Exports of agricultural implements declined to $1,202,000 from $1,680,000.

In the first nine months of 1931 total machinery exports declined to $264,756,000 from $417,939,000 in the corresponding period of last year.

Imports of machinery in August rose to $1,017,677 from $937,411 in August.

Imports of Machinery into the United States

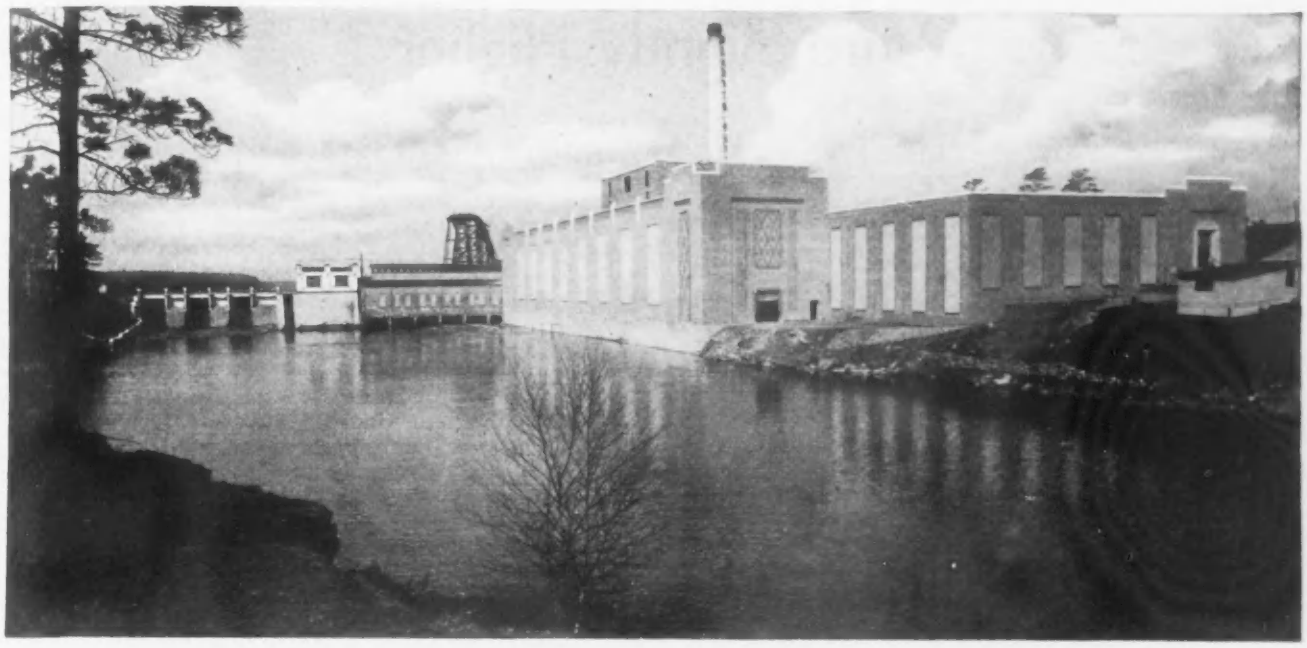
	September		Nine Months Ended September	
	1931	1930	1931	1930
Metal-working machine tools	$18,050	$83,826	$200,547	$800,188
Agricultural machinery and implements	71,686	242,530	2,930,831	7,870,497
Electrical machinery and apparatus	295,060	310,571	2,079,615	2,608,462
Other power-generating machinery	27,591	26,302	246,651	455,822
Other machinery	383,913	441,567	3,563,015	6,679,865
Vehicles, except agricultural	221,377	148,064	2,233,024	2,011,361
Total	$1,017,677	$1,252,860	$11,253,683	$19,826,195

Machinery Exports from the United States

(By Value in Thousands of Dollars)

	September		Nine Months Ended September	
	1931	1930	1931	1930
Locomotives	$1,130	$10	$1,277	$595
Other steam engines	3	47	145	504
Boilers	19	99	306	1,107
Accessories and parts	17	59	503	724
Automobile engines	129	160	2,036	3,907
Other internal combustion engines	152	436	3,384	6,770
Accessories and parts	142	261	1,766	2,770
Electric locomotives	19	129	576	791
Other electric machinery and apparatus	313	875	3,533	8,053
Excavating machinery	538	478	3,655	7,821
Concrete mixers	7	51	235	724
Road making machinery	88	103	1,086	2,826
Elevators and elevator machinery	255	262	2,789	4,016
Mining and quarrying machinery	1,231	920	12,661	12,305
Oil-well machinery	1,081	1,718	9,430	20,809
Pumps	241	768	3,705	7,332
Bending and power presses	....	231	....	3,332
Forging machines	701	169	3,329	1,641
Machine tools	3,861	1,839	32,972	19,870
Other metal-working machinery and parts	493	574	3,162	5,214
Textile machinery	497	649	5,039	6,769
Sewing machines	256	422	2,887	5,550
Shoe machinery	60	152	789	1,336
Flour-mill and gristmill machinery	23	104	217	344
Sugar-mill machinery	120	389	869	3,390
Paper and pulp-mill machinery	76	326	1,060	2,668
Sawmill machinery	25	36	463	585
Other woodworking machinery	39	180	758	1,415
Refrigerating and ice-making machinery	50	389	835	3,171
Air compressors	161	293	2,086	4,662
Typewriters	513	1,188	6,519	13,235
Power laundry machinery	40	70	612	1,111
Typesetting machines	75	316	1,902	2,988
Printing presses	81	506	1,717	4,185
Agricultural machinery and implements	1,202	5,014	54,810	97,276
All other machinery and parts	11,077	14,350	97,633	156,143
Total	$24,715	$33,583	$264,756	$417,939

Those vertical panels in the building illustrated are not windows—they're made of cement—light in color for decorative purposes.



No windows here ..yet employees enjoy BETTER than daylight

From the other side of the world, with the ears that Nature gave you, you hear a man speak. Man's improvement on nature! By television you see through concrete and steel buildings miles away. Man's improvement on Nature! An airplane flies past a million birds and goes around the world in eight days. Man's improvement on Nature!

Then, can man make a light that is better than daylight? Well, the above picture is that of the Blandin Paper Company's new mill at Grand Rapids, Minnesota—and please note, it has *no windows!* Heating, ventilating and lighting systems are scientifically engineered and controlled. Improvements on Nature!

Cooper Hewitt Mercury-Vapor Lamps give employees here better than daylight illumination. For Cooper Hewitt Light is composed *almost wholly* of the yellow-green rays of the spectrum—the *best-seeing rays* of the spectrum. It is light without eye-fatiguing glare. It produces no dark shadows. Almost perfectly diffused from a long (50-inch) glass tube, it reaches in and around and under machinery—seems to magnify the smallest details.

In addition, these lamps, equipped with special glass tubes, emit health-promoting ultra-violet rays equivalent to the ultra-violet radiation of average June sunlight.

These and many other advantages of Cooper Hewitt Light are described in the booklet, "Why Cooper Hewitt Light Is Better Than Daylight." Yours, gratis, on request—with no obligation on your part. Address: General Electric Vapor Lamp Company, 833 Adams Street, Hoboken, N. J.

Join the "G-E Circle" every week-day noon, E.S.T. (except Saturday) and every Sunday at 5:30 P.M. N.B.C. Network of 54 stations.

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GENERAL ELECTRIC
VAPOR LAMP COMPANY

Lowest Exports in 23 Years; Imports Were Slightly Higher

WASHINGTON, Oct. 30.—Exports of iron and steel from the United States continued to dwindle in September, when they sank to only 69,768 gross tons, the lowest since May, 1908, when they were 64,042 tons. Compared with August of the present year they showed a decline of 3570 tons. In the first nine months of 1931 exports were 789,114 tons, a drop of 847,055 tons or 52 per cent under the outgoing movement for the like period of last year.

Imports in September were 30,966 tons, a gain of only 827 tons over August. In the first nine months imports aggregated 330,389 tons, a decline of 84,906 tons under incoming shipments in the same period of last year.

The largest export movement in August was made by scrap, with a total of 10,000 tons, of which 6279 tons went to Canada and 2982 tons to Japan. The heaviest movement of any finished line was in tin plate, 7236 tons, of which 2347 tons went to Japan, 1125 tons to China and 980 tons to Argentina.

Canada took 31,435 tons or 44 per cent of the September exports, while the next largest consuming country was Japan, which took only 8610 tons.

The largest imported item in the iron and steel list was structural shapes, 5266 tons, of which 2311 tons came from Belgium, 1595 tons from France and 1278 tons from Germany. India supplied 4814 tons of the 5104 tons of pig iron imported. Of the 4676 tons of merchant steel bars received, Belgium supplied 1888 tons. Germany 1396 tons and France 1151 tons. Imports of reinforcement bars were 3571 tons, of which 2902 tons came from Belgium, 374 tons from Germany and 295 tons from France.

The Gold Coast of Africa furnished 16,409 tons of the manganese ore imports, totaling 26,630 tons. Russia supplied 4175 tons; Brazil, 4217 tons; and India, 1820 tons. Imports of ferromanganese were 976 tons, of which 647 tons came from Canada and 280 tons from the United Kingdom.

Belgium was the chief source of imports, supplying 10,987 tons. Germany supplied 6196 tons and France, 4559 tons.

Exports of Iron and Steel from the United States
(In Gross Tons)

	September		Nine Months Ended September	
	1931	1930	1931	1930
Pig iron	668	833	5,140	11,213
Ferromanganese	36	73	1,243	6,138
Scrap	10,000	8,394	110,257	326,556
Pig iron, ferroalloys and scrap	*10,704*	*9,300*	*116,640*	*343,907*
Ingots, blooms, billets, sheet bar	950	256	3,461	14,968
Skelp	3,577	12,959	47,941	85,750
Wire rods	2,675	1,288	26,938	32,584
Semi-finished steel	*7,202*	*14,503*	*78,340*	*133,302*
Steel bars	2,000	3,739	30,665	69,545
Alloy steel bars	37	487	2,619	5,703
Iron bars	98	171	903	1,512
Plates, iron and steel	2,523	5,938	38,004	82,246
Sheets, galvanized steel	2,889	5,059	39,484	70,030
Sheets, galvanized iron	202	428	3,691	5,135
Sheets, black steel	6,639	10,339	70,943	91,685
Sheets, black iron	234	998	4,740	8,992
Hoops, bands, strip steel	1,098	2,609	23,451	33,451
Tin plate; terne plate	7,236	21,402	66,063	180,706
Structural shapes, plain material	9,520	12,128	78,631	113,520
Structural material, fabricated	1,034	10,214	26,768	82,470
Tanks, steel	115	1,095	10,364	13,701
Steel rails	1,576	6,526	26,179	87,796
Rail fastenings, switches, frogs, etc.	307	1,236	6,090	15,844
Boiler tubes	656	1,158	5,841	12,183
Casing and oil-line pipe	1,126	2,952	19,806	52,116
Pipe, black and galvanized, welded steel	7,201	5,368	41,916	66,163
Pipe, black and galvanized, welded iron	594	713	4,568	12,589
Plain wire	835	1,474	10,699	20,572
Barbed wire and woven wire fencing	1,005	3,567	19,997	31,897
Wire cloth and screening	55	122	1,076	1,345
Wire rope	211	453	2,056	3,773
Wire nails	340	870	6,125	6,346
Other nails and tacks	271	404	2,960	4,685
Horseshoes	62	2	127	136
Bolts, nuts, rivets and washers, except track	272	659	3,983	8,260
Rolled and finished steel	*48,136*	*100,111*	*547,749*	*1,082,401*
Cast iron pipe and fittings	1,144	2,152	18,936	25,381
Malleable iron screwed fittings	218	720	3,792	8,355
Car wheels and axles	523	1,371	5,328	11,583
Iron castings	246	339	3,489	5,405
Steel castings	99	558	2,828	8,103
Forgings	533	294	6,110	6,806
Castings and forgings	*2,763*	*5,434*	*40,483*	*65,633*
All other	963	1,697	5,902	10,926
Total	69,768	131,045	789,114	1,636,169

Imports of Iron and Steel Products into the United States
(In Gross Tons)

	September		Nine Months Ended September	
	1931	1930	1931	1930
Pig iron	5,104	10,330	70,197	91,387
Sponge iron	1	1	210	
Ferromanganese and spiegeleisen*	976	2,265	20,349	45,372
Ferrochrome†	.....	.....	96	162
Ferrosilicon‡	22	4	620	4,257
Other ferroalloys	311	.....	1,550	285
Scrap	746	2,233	13,959	20,534
Pig iron, ferroalloys and scrap	*7,160*	*14,833*	*106,981*	*161,997*
Steel ingots, blooms, billets, etc.	1,661	3,218	15,010	15,963
Wire rods	593	400	5,578	7,080
Semi-finished steel	*2,254*	*3,618*	*20,588*	*23,043*
Concrete reinforcem't bars	3,571	3,666	31,790	
Hollow bar and drill steel	127	189	1,277	24,113
Merchant steel bars	4,676	2,414	37,206	
Iron bars	30	91	722	989
Iron slabs	.....	.....	40	
Boiler and other plate	1	.....	729	1,792
Sheets, skelp and saw plate	1,852	788	15,204	20,718
Tin plate	34	48	147	207
Structural shapes	5,266	6,537	55,643	106,058
Sheet piling	2	.....	581	
Rails and rail fastenings	303	2,221	4,444	7,275
Welded pipe	888	654	5,976	4,947
Other pipe	223	664	6,307	11,694
Barbed wire	404	263	6,354	3,590
Round iron and steel wire	138	225	2,093	3,745
Flat wire and strip steel	74	100	522	973
Wire rope and strand	177	122	1,434	2,022
Other wire	21	51	440	300
Hoops and bands	2,857	2,916	16,262	17,249
Nails, tacks and staples	446	418	6,845	4,245
Bolts, nuts and rivets	57	33	756	291
Other finished steel	.....	6	219	43
Rolled and finished steel	*21,147*	*21,406*	*194,991*	*220,251*
Cast iron pipe and fittings	236	351	6,351	8,780
Castings and forgings	169	77	1,478	1,224
Total	30,966	40,285	330,389	415,295
Manganese ore*	26,630	21,571	.....	223,671
Iron ore	99,124	215,493	1,211,714	2,338,809
Magnesite (dead burned)	.....	5,302	10,773	34,074

*Manganese content only.
†Chromium content only.
‡Silicon content only.